Metrologic®

METROLOGIC INSTRUMENTS, INC.

MS2020 Stratos™ Series
Installation and User's Guide

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INTRODUCTION

MANUAL SCOPE

This guide provides an overview of the scanner and scanner/scale operation with detailed information about setup and installation. Adobe® Acrobat® versions of the user's manuals are also available for download from the Metrologic website (www.metrologic.com).

MANUAL SYMBOL KEY

	Caution!
	Important Additional Information.
	Manufactures Note

PRODUCT OVERVIEW

Metrologic's Stratos series is designed to meet the demanding needs of high volume supermarket and point-of-sale applications. With advanced features like 6-sided, 360° scanning, 6000 scans per second, a complex scan zone and advanced decoding software, this high performance series of in-counter scanner/scale products guarantees fast customer checkouts with minimal operator fatigue and stress. The MS2020 series is equipped with a multitude of standard features including:

- StratosSCAN™ - 6-sided, 360° scanning that minimizes product orientation
- StratosSPHERE™ - Decoding software that reads poor quality and damaged bar codes
- StratosSYNC™ - Horizontal and vertical scanning zones operate independently from one another
- RSS-14 Decoding – Decodes RSS-14, RSS Limited and RSS expanded emerging symbologies
- Flash ROM – Upgrade latest software enhancements on site.
- Powered Aux Port – Connect hand-held scanner for large or bulky items
- Integrated Scale – Factory integrated field upgradeable scale
- Loud Speaker – 3 volume/7 tone settings can be heard in all environments
- Easy Programming – Windows® based utility or simple bar code setup
- Fully Automatic – "No touch" infrared wake up from power save modes
- EAS Deactivation – Electronic Article Surveillance (EAS) included
- Field Replaceable Vertical Window – Quickly remove vertical window for cleaning or replacement
- StratosSCOPE™ - Visual diagnostic indicator for easy-to read feedback on scanner condition
- StratosSTATS™ - Modular optics engine technology – small, prealigned, field replaceable modules
- StratosSCHOOL™ - operator training software
- StratosSTATS™ - code checking software to monitor characteristically hard to scan codes

Metrologic's Stratos Series is available in three base models.

BASE MODEL NO.	DESCRIPTION
MS2020-xx	Scanner with integrated scale – full size
MS2021-xx	Scanner only – full size
MS2022-xx	Scanner only – compact size
-xx = Interface type see model number designation for options.	

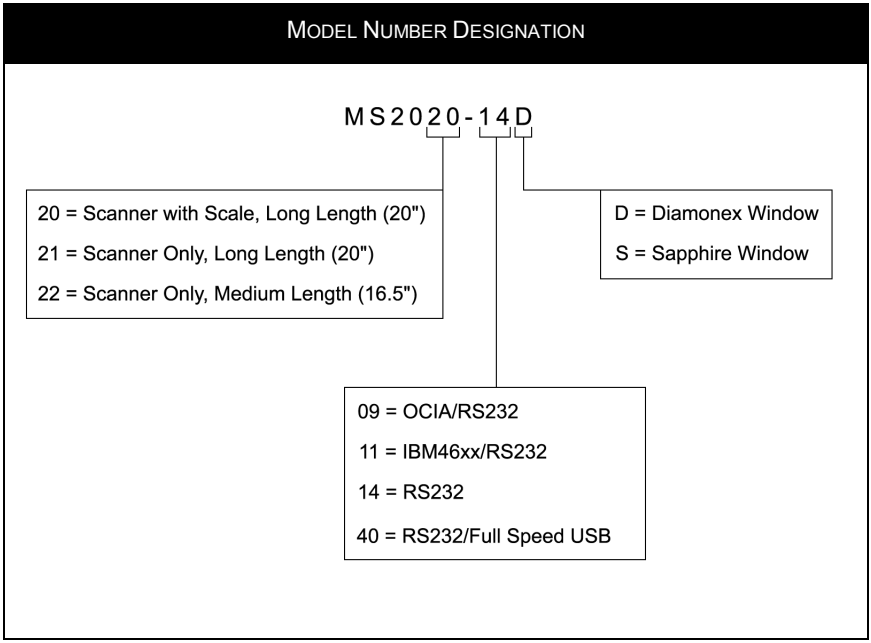

MODEL NUMBER DESIGNATION
MS2020-14D
20 = Scanner with Scale, Long Length (20")
21 = Scanner Only, Long Length (20")
22 = Scanner Only, Medium Length (16.5")
D = Diamonex Window
S = Sapphire Window
09 = OCIA/RS232
11 = IBM46xx/RS232
14 = RS232
40 = RS232/Full Speed USB

Figure 1. Model Number Designation

BASE KIT COMPONENTS AND OPTIONAL ACCESSORIES

BASE KIT	
Part #	**Description**
MS202x-xxx	Stratos™ Series Scanner
00-02407	MetroSelect® Programming Guide
00-02983A	MS2020 Stratos Series Installation and User's Guide
52-52511A	24" EAS cable

Guides also available for download at www.metrologic.com.

OPTIONAL ACCESSORIES	
Part #	**Description**
57-57xxx*	Interface Cable Straight, 3.7 m (12ft.) cord with short strain relief
xxx specifies connection to the host. Contact a customer service representative for additional information.*	
MVC-**	Metrologic Voltage Converter Cable +12VDC to +5VDC or -12VDC to +5.2VDC
** Contact a Metrologic Customer Service representative for additional information on Metrologic's MVC cable series and the host connections available.	
53-53004	RS232 Aux Cable, Coiled 2.7 m (9') cord
54-54004	RS232 Aux Cable, Straight 2.1 m (7') cord
54-54667	RS232 PowerLink AUX Cable with built in power jack Straight, 2.1 m (7') cord with long strain relief

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

BASE KIT COMPONENTS AND OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES	
Part #	**Description**
AC to DC Power Transformer - Regulated +5V @ 1.5 A +12V @ 1.5 A	
46-46812	120V United States
46-46813	220V – 240V Continental European
46-46814	220V – 240V United Kingdom
46-46817	220V – 240V China
46-46928	220V – 240V Australia
46-46816	Remote Scale Display

REPLACEMENT PARTS

REPLACEMENT PARTS	
Part #	**Description**
⚠ Caution	Window types (Diamonex and Sapphire) are <u>not</u> interchangeable due to laser safety and/or scanner performance differences. To change window type, the scanner must be returned to the manufacturer for reconfiguration.
46-46805	Vertical Window
46-46806	Diamonex Platter - Full Size
46-46807	Diamonex Platter - Compact Size
46-46808	Sapphire Platter - Full Size
46-46809	Sapphire Platter - Compact Size
The following replacement parts are available for purchase by a Metrologic authorized service representative only.	
46-46810	Vertical Optics Engine Module
46-46811	Horizontal Optics Engine Module
46-46815	MS2022 to MS2020 Scale Upgrade / Replacement Kit
46-46819	MS2021 to MS2020 Scale Upgrade / Replacement Kit

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

GENERAL PRECAUTIONS

The following are some general precautions to remember when handling your MS2020 Series scanner.

DO NOT TURN
the unit upside down with the platter in place.

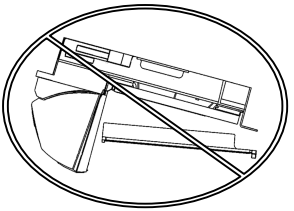


Figure 2.

DO NOT PRESS
on the window in the replacement platter or the vertical window frame.

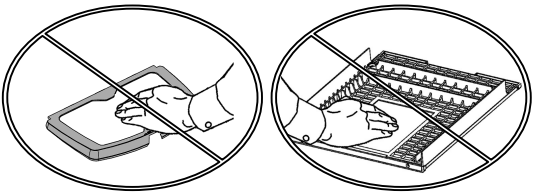


Figure 3.

LIFT the platter straight up to remove.

No hardware or tools are required to remove or replace the platter.

⚠ *See caution statement on page 6.*

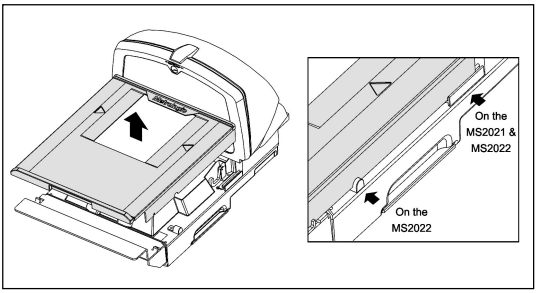


Figure 4.

REST your thumbs against the vertical window frame when lifting the unit with the provided handles.

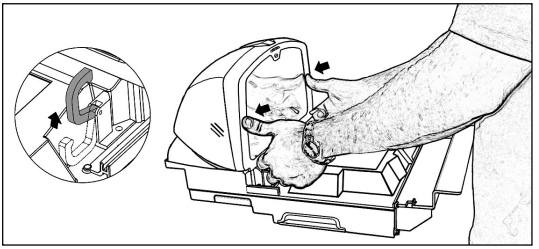


Figure 5.

MS2020 SERIES DESIGN SPECIFICATIONS

	Design Specifications
Operational	
Light Source	VLD 650 ± 10 nm:
Laser Power:	1.5 mW / 2.2 mW (horizontal / vertical)
Depth of Field:	0 mm - 152 mm (0”- 6”) for 0.33 mm (13 mil) bar code
Depth of Field:	0 mm - 216 mm (0”- 8.5”) for 0.33 mm (13 mil) bar code
Scan Speed:	6000 scans lines per second
No. of Scan Lines:	68 (40 horizontal / 28 vertical)
Motor Speed:	4800 / 6000 RPM
Min Bar Width:	0.152 mm (6.0 mil) ,
Decode Capability:	All standard 1-D bar codes RSS-14, RSS-Expanded, and RSS-14 Limited
System Interfaces:	RS232, Aux RS232, IBM468x/469x, USB (low speed and full speed), OCIA
Print Contrast:	35% minimum reflectance difference
No. Characters Read:	up to 80 data characters (Maximum number will vary based on symbology and density)
Roll, Pitch, Yaw:	360°, 60°, 60°:
Beeper Operation:	7 tones or no beep; 3 volume settings
Indicators (LED)	Blue = laser on, ready to scan; White = good read, decoding
Mechanical	
Length:	MS2020 (full size scanner/scale), 508 mm (20.0")
	MS2021 (full size scanner only), 508 mm (20.0")
	MS2022 (compact size scanner only), 420 mm (16.5")
Width:	268 mm (11.3")
Depth (below counter):	101 mm (4.0")
Height (above counter):	178 mm (7.0")
Weight:	MS2020 9.1 Kg (25 lbs.)
	MS2021 7.2 Kg (16 lbs.)
	MS2022 6.8 Kg (15 lbs.)

Specifications subject to change without notice.

MS2020 SERIES DESIGN SPECIFICATIONS (CONTINUED)

	Design Specifications	
Scale Capacities		
Capacity**:**	15 kg	30.0 lb.
Minimum Increment:	0.005 kg	0.01 lb.
Maximum Static Weight:	75 kg	150 lb.
Adjustments required:	Calibration Only	
Electrical		
Voltage Supply:	1.5 A @ +5V / 1.5A @ +12V	
Operating Power:	14.25 Watts	
Standby Power:	3.25 Watts	
Operating Current:	1 A @ 5V / .75 A @ 12V	
Standby Current:	.44 A @ 5V / .08 A @ 12V	
DC Transformers:	Class II; 5VDC @ 1.5 A; 12 VDC @ 1.5 A	
Laser Class 1:	IEC 60825-1:1993+A1:1997+A2:2001 EN 60825-1:1994+A11:1996+A2:2001	
EMC:	FCC, ICES-003 & EN 55022 Class A	
Environmental		
Operating Temperature:	0°C to 40°C (32°F to 104°F)	
IP Rating:	IP 55	
Storage Temperature:	-40°C to 60°C (-40°F to 140°F)	
Humidity:	5% to 95% relative humidity, non-condensing	
Contaminants:	Sealed to resist airborne particulate contaminants	
Ventilation:	None required	

Specifications subject to change without notice.

MS2020 Scanner/Scale

Components

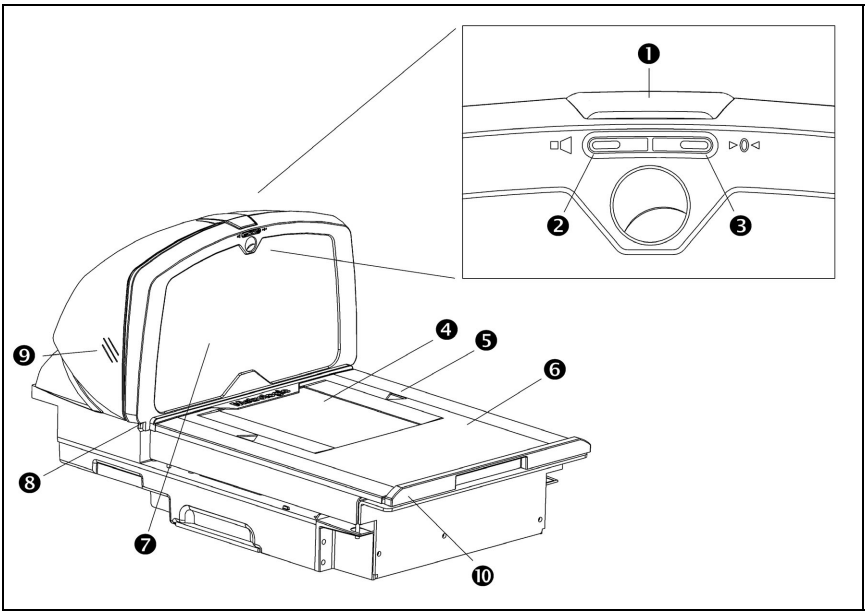


Figure 6. MS2020 Components

ITEM NO.	DESCRIPTION
1	Blue and White LEDs
2	Volume/Tone Button (Multi-Function)
3	Scale Zero Button
4	Diamonex or Sapphire Horizontal Window (Laser Aperture)
5	Flow Direction Indicator
6	Stainless Steel Platter (Replaceable)
7	Replaceable Vertical Window with High Impact Frame (Laser Aperture)
8	Debris Guard
9	Speaker
10	Product Weight/Roll Bar

MS2020 Scanner/Scale

Components

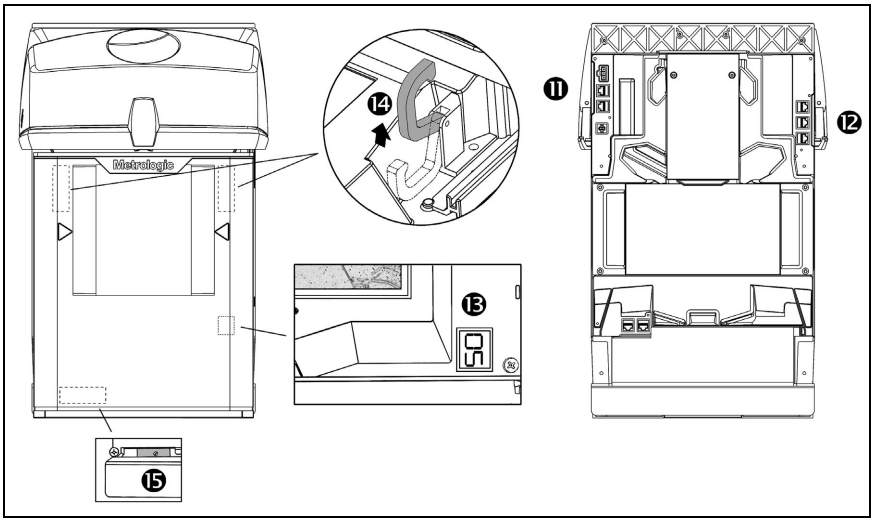


Figure 7. MS2020 Components

ITEM NO.	DESCRIPTION
11	Power, Scale and EAS Connectors
12	Interface and Aux Scanner Connectors
13	Diagnostic Indicator Display (Located Under Platter)
14	Lift Handles (Located Under Platter)
15	Sealed Calibration Switch Cover (Located Under Platter) On a fully installed unit the calibration switch cover should be sealed with a lead wire or paper seal. This seal indicates the appropriate Federal, State and Local Weights and Measures authorities have calibrated the scale. See the *Scale Operation: Calibration* section of this guide for further information.

MS2020 Scanner/Scale

Dimensions

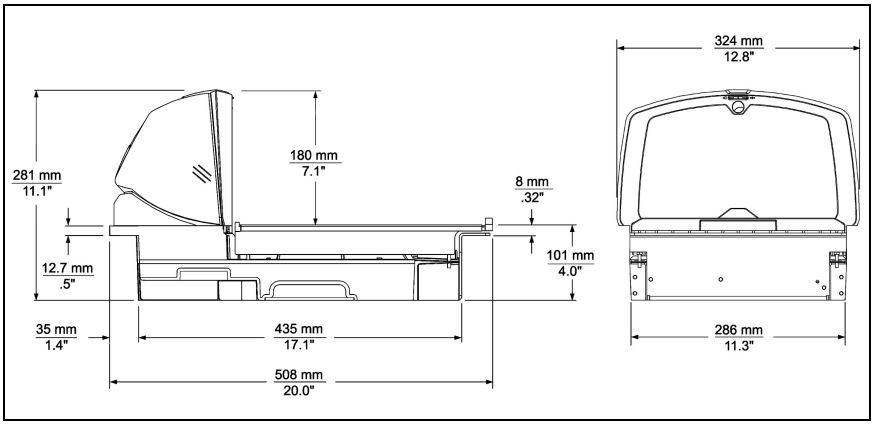


Figure 8. MS2020 Dimensions

Connector Panel

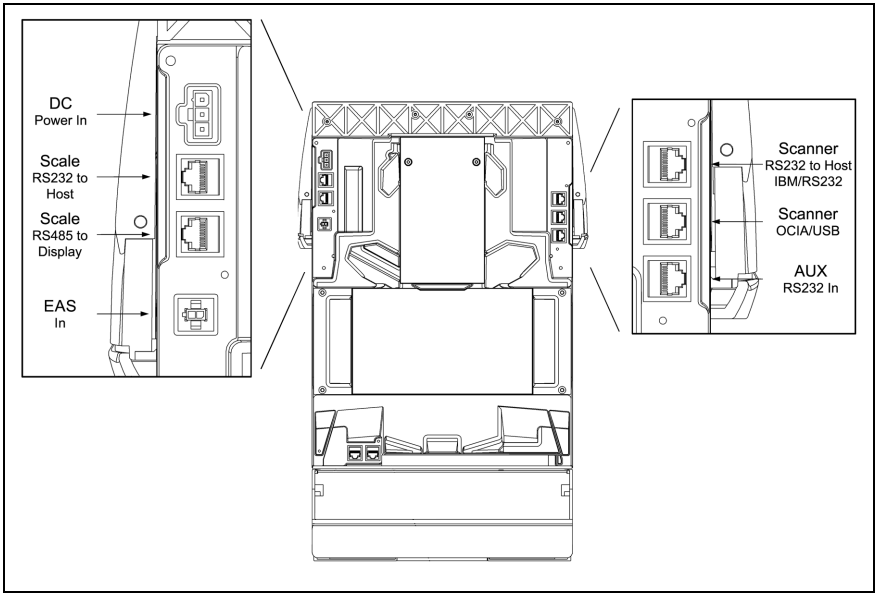


Figure 9. MS2020 Connectors

MS2020 Scanner/Scale

Caution and Serial Number Labels

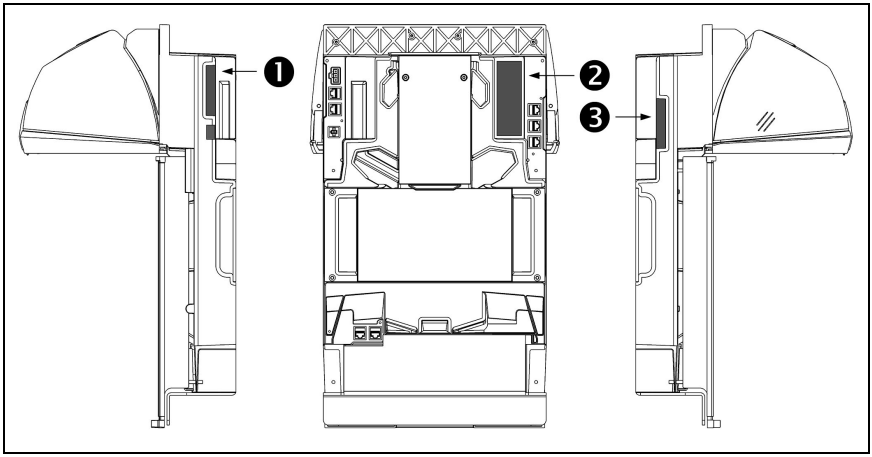


Figure 10. MS2020 Label Locations (Top) and Examples (Bottom)

❶

EAS In	Scale RS485 to Display	Scale RS232 to Host	DC Power In

❷

Metrologic Instruments Inc.
Blackwood New Jersey, USA
Contains no user servicable components. Warranty void if case is opened. Complies with FCC and ICES-003 Class B.
See manual.
Manufactured Blackwood, NJ. February 2003 (P)
Model: MS2020-14D 232 5V, 12V ⎓
Stratos™ Barcode Scanner
37 03 09 0011
See User's Guide for patent coverage.

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated July 26, 2001.

CLASS 1 LASER PRODUCT
LASER KLASSE 1 PRODUKT
APPAREIL A LASER DE CLASSE 1

❸

Scanner RS232 to Host	N/C	Aux RS232 In	On MS2020-14 Model
Scanner RS232 / IBM 46XX to Host	N/C	Aux RS232 In	On MS2020-11 Model
Scanner RS232 to Host	Scanner USB to Host	Aux RS232 In	On MS2020-08 & MS2020-40 Models
Scanner RS232 to Host	Scanner OCIA to Host	Aux RS232 In	On MS2020-09 Model

Optional Remote Scale Display

Dimensions

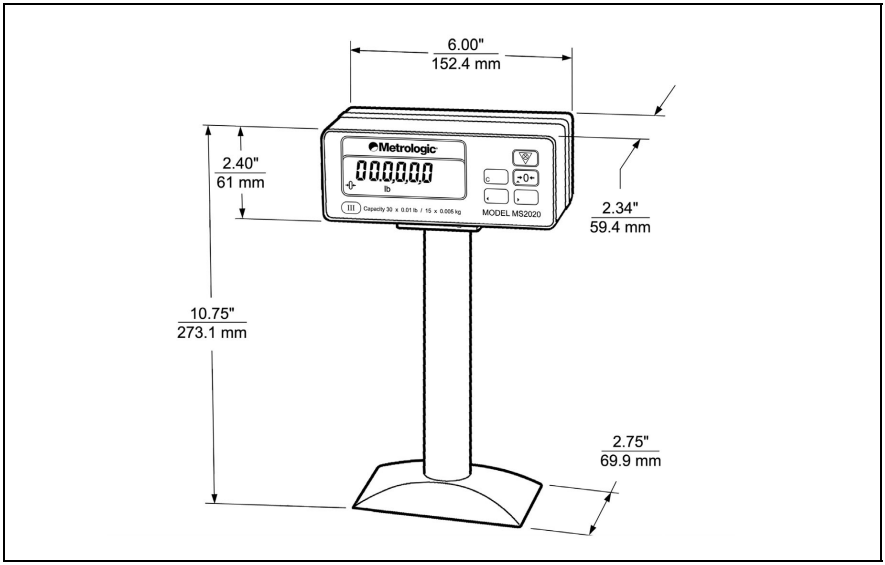


Figure 11. Optional Remote Scale Display Dimensions

Control Panel

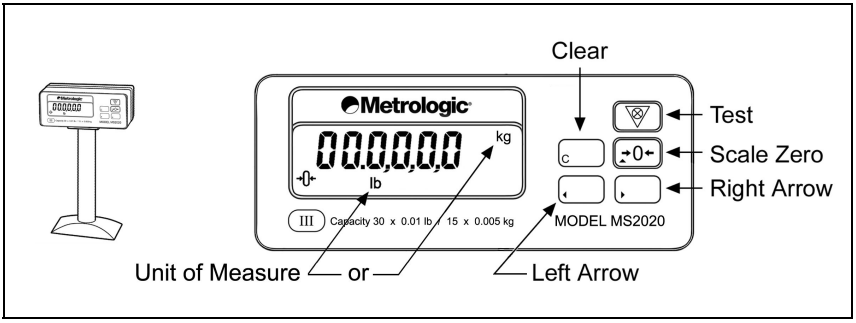


Figure 12. Optional Remote Scale Display Controls

MS2021 Scanner

Components

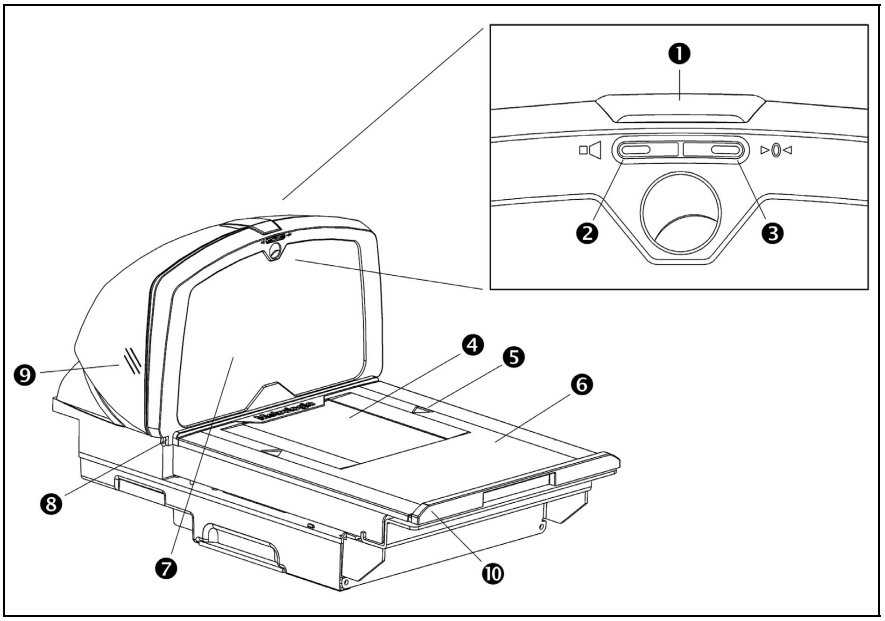


Figure 13. MS2021 Components

ITEM NO.	DESCRIPTION
1	Blue and White LEDs
2	Volume Button Volume/Tone Button (Multi-Function)
3	Scale Zero Button (On the MS2020 Series Only)
4	Diamonex or Sapphire Horizontal Window (Laser Aperture)
5	Flow Direction Indicator
6	Stainless Steel Platter (Replaceable)
7	Replaceable Vertical Window with High Impact Frame (Laser Aperture)
8	Debris Guard
9	Speaker
10	Product Roll Bar/Debris Guard

MS2021 Scanner

Components

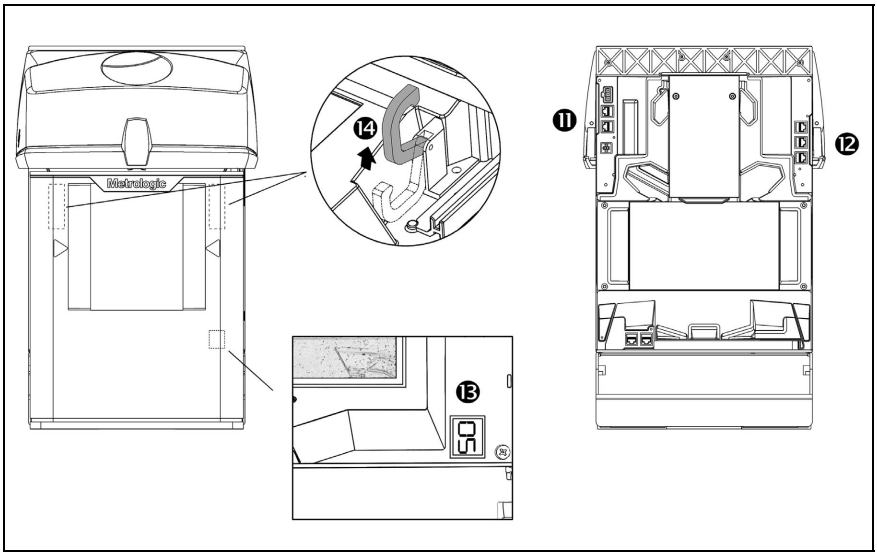


Figure 14. MS2021 Components

ITEM NO.	DESCRIPTION
11	Power, Scale and EAS Connectors
12	Interface and Aux Scanner Connectors
13	Diagnostic Indicator Display (Located Under Platter)
14	Lift Handles (Located Under Platter)

MS2021 Scanner

Dimensions

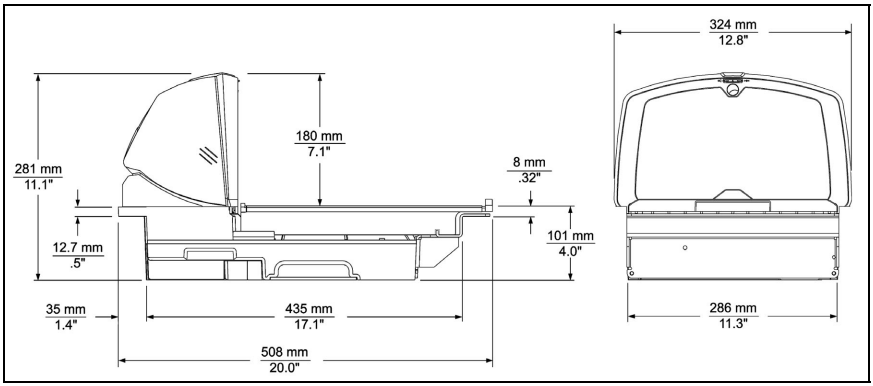


Figure 15. MS2021 Dimensions

Connector Panel

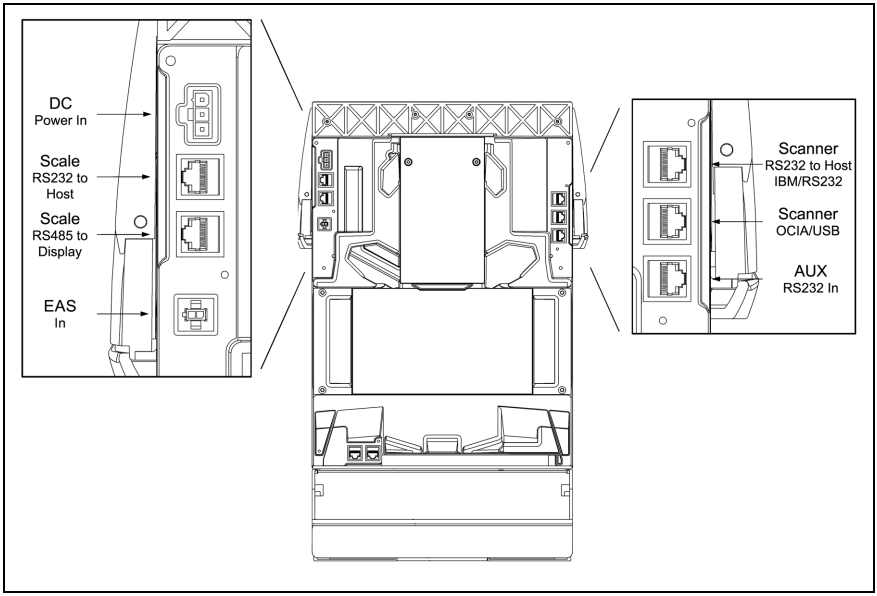


Figure 16. MS2021 Connectors

MS2021 Scanner

Caution and Serial Number Labels

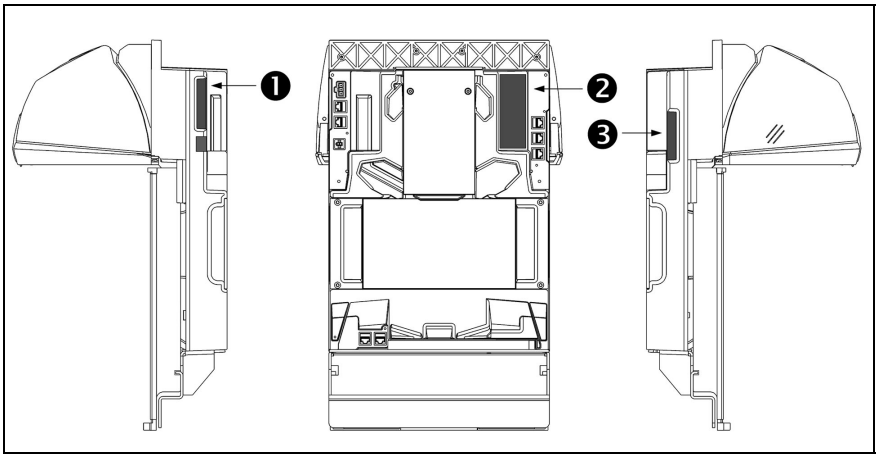


Figure 17. MS2021 Label Locations (Top) and Examples (Bottom)

1

EAS In	Scale RS485 to Display	Scale RS232 to Host	DC Power In

2

Metrologic Instruments Inc.
Blackwood New Jersey, USA
Contains no user servicable components. Warranty void if case is opened. Complies with FCC and ICES-003 Class B. See manual.
Manufactured Blackwood, NJ. February 2003 (P)
Model: MS2021-14D 232 5V, 12V ⎓
Stratos™ Barcode Scanner
37 03 09 0011
See User's Guide for patent coverage.

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated July 26, 2001.

CLASS 1 LASER PRODUCT
LASER KLASSE 1 PRODUKT
APPAREIL A LASER DE CLASSE 1

3

Scanner RS232 to Host	N/C	Aux RS232 In	On MS2021-14 Model
Scanner RS232 / IBM 46XX to Host	N/C	Aux RS232 In	On MS2021-11 Model
Scanner RS232 to Host	Scanner USB to Host	Aux RS232 In	On MS2021-08 & MS2021-40 Models
Scanner RS232 to Host	Scanner OCIA to Host	Aux RS232 In	On MS2021-09 Model

MS2022 Scanner

Components

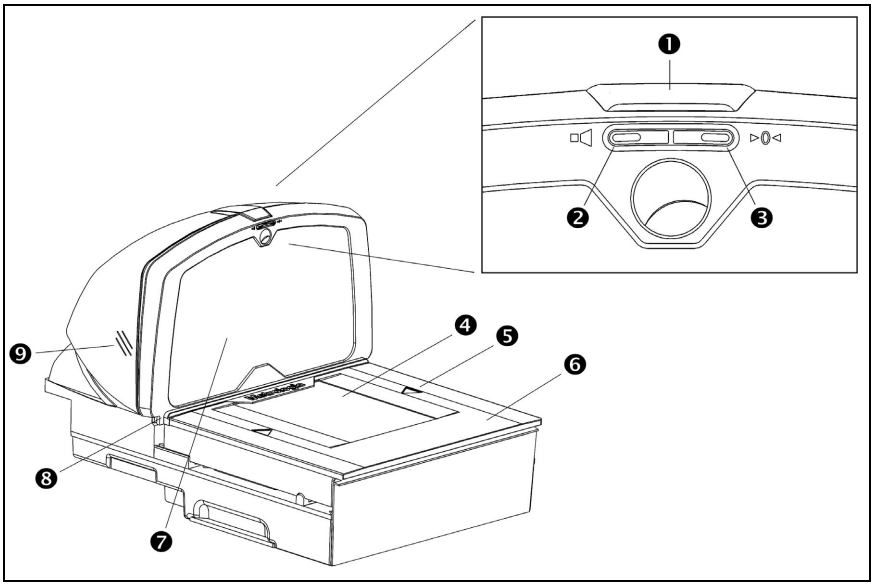


Figure 18. MS2022 Components

ITEM NO.	DESCRIPTION
1	Blue and White LEDs
2	Volume/Tone Button (Multi-Function)
3	Scale Zero Button (On the MS2020 Series Only)
4	Diamonex or Sapphire Horizontal Window (Laser Aperture)
5	Flow Direction Indicator
6	Stainless Steel Platter (Replaceable)
7	Replaceable Vertical Window with High Impact Frame (Laser Aperture)
8	Debris Guard
9	Speaker

MS2022 Scanner

Components

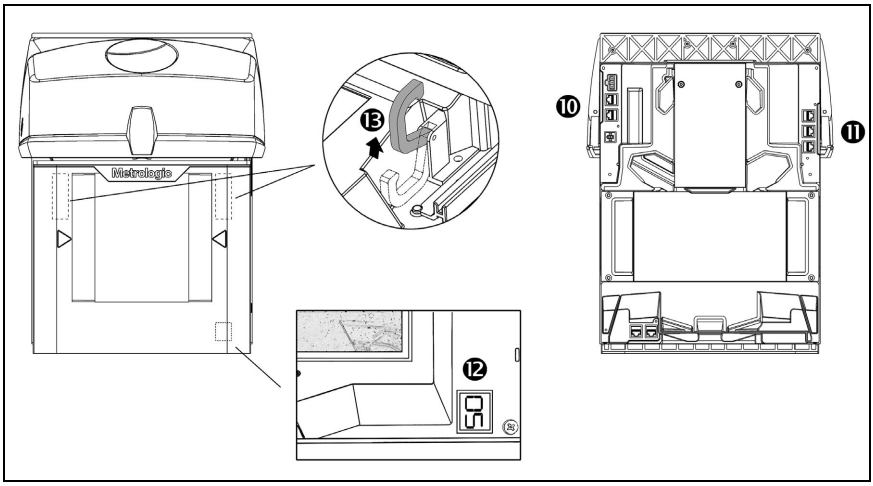


Figure 19. MS2022 Components

ITEM NO.	DESCRIPTION
10	Power, Scale and EAS Connectors
11	Interface and Aux Scanner Connectors
12	Diagnostic Indicator Display (Located Under Platter)
13	Lift Handles (Located Under Platter)

MS2022 Scanner

Dimensions

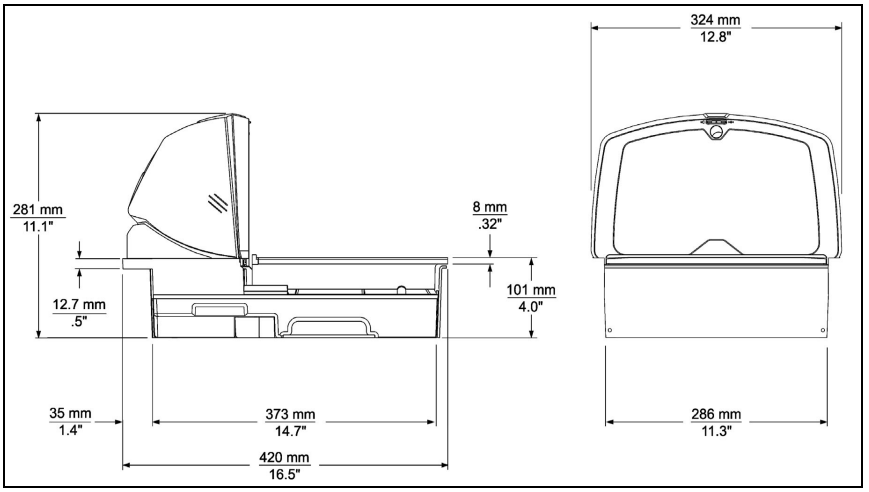


Figure 20. MS2022 Connectors

Connector Panel

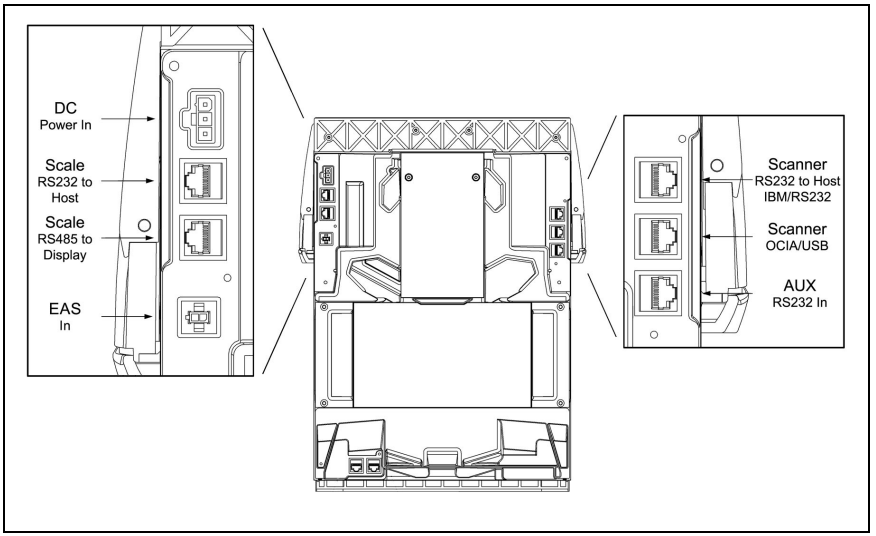


Figure 21. MS2022 Connectors

MS2022 Scanner

Caution and Serial Number Labels

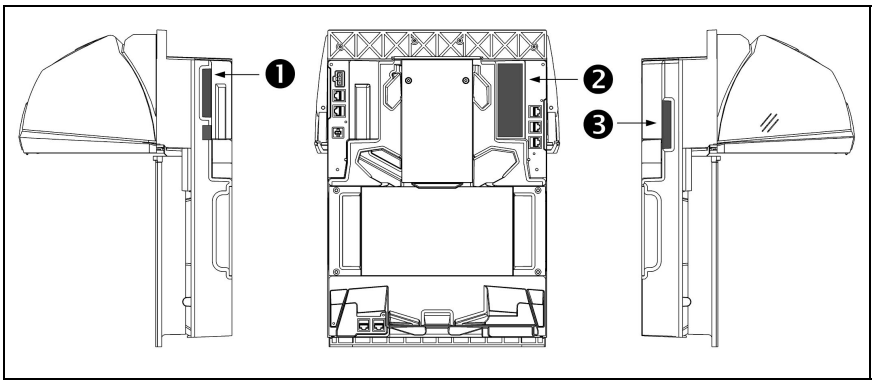


Figure 22. MS2022 Label Locations (Top) and Examples (Bottom)

1

EAS In	Scale RS485 to Display	Scale RS232 to Host	DC Power In

2

Metrologic Instruments Inc.
Blackwood New Jersey, USA
Contains no user servicable components. Warranty void if case is opened. Complies with FCC and ICES-003 Class B. See manual.
Manufactured Blackwood, NJ. February 2003 (P)
Model: MS2022-14D 232 5V, 12V ⎓
Stratos™ Barcode Scanner
37 03 09 0011
See User's Guide for patent coverage.

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated July 26, 2001.

CLASS 1 LASER PRODUCT
LASER KLASSE 1 PRODUKT
APPAREIL A LASER DE CLASSE 1

3

Scanner RS232 to Host	N/C	Aux RS232 In	On MS2022-14 Model
Scanner RS232 / IBM 46XX to Host	N/C	Aux RS232 In	On MS2022-11 Model
Scanner RS232 to Host	Scanner USB to Host	Aux RS232 In	On MS2022-08 & MS2022-40 Models
Scanner RS232 to Host	Scanner OCIA to Host	Aux RS232 In	On MS2022-09 Model

QUICK INSTALLATION OUTLINE

The following is a quick preview of the steps required for 1st time installations. Each item is discussed in detail later in this section.

- Determine clearance, ventilation and service access requirements.
- Determine checkstand layout taking into account package flow, cable routing and power requirements.
- Choose the mounting option which provides the best cable/power access and unit stability.
- Unpack the unit.
- Make the appropriate countertop cutouts and install all support brackets.
- Place the unit in the counter.
- Install the platter.
- Follow the steps under the correct interface to connect the cables and power supply.
- Program the unit for the correct interface.
- Calibrate the scale (for the MS2020 model only).

SITE REQUIREMENTS

Before installing your Stratos scanner/scale, please consider the following items.

Vertical Clearance

A minimum clearance height of 7.50" from the checkstand surface is needed for the vertical 'hood' on all of the scanner models. Additional clearance is recommended for unobstructed LED viewing by the operator.

Ventilation and Spacing

All Stratos models have a die-cast housing to dissipate heat allowing the unit to operate without a ventilation fan. Metrologic recommends that the temperature surrounding the unit does not exceed 40°C (104°F). There should be adequate convection and minimal heat producing equipment in close proximity of the unit. A cooling fan with a filter is recommended if there will be a conveyor motor or other heat producing equipment close to the unit that will create a high temperature environment.

Adequate spacing between the unit and the checkstand opening is required for proper operation of the scale. When the scanner/scale model is mounted properly, the scale platter should be able to move up and down freely without hitting the edges of the checkstand cutout. Refer to *Installing the Unit in the Counter* for detailed cutout dimensions and mounting instructions.

SITE REQUIREMENTS

Service Access

When routing and installing the cable(s) and power supply, make sure you leave access that these components may be swapped easily without the need to remove the unit from the checkstand.

When changing the StratosSWAP optics engine modules, Metrologic recommends removing the unit completely from the checkstand.

When calibrating or zeroing the scale, do not remove the unit from the checkstand. Refer to the *Scale Operation Section* of this guide for detailed instructions on zeroing and calibration.

Power Installation

The Power Supply (AC/DC) should be connected to an AC Outlet that is free of electrical noise (clean). A qualified electrician can determine the amount of electrical noise on the AC line. See additional information on power installation and restrictions on pages 31 - 45.

Checkstand Layout Considerations

When placing a scanner in a checkstand, the following factors should be considered.

- Items should flow at a distance to the operator that maximizes comfort. The operator should not need to stretch or strain to reach for and scan packages.

- The Stratos can scan a bar code on all 6 sides of a package. The packages should flow into the scan area that provides the maximum reading performance. No lifting or orientation of the items is necessary. A properly placed item diverter can maximize the flow of packages.

- In what direction are the packages flowing? Most checkstands are designed for left-handed takeaway. If the operator is facing the vertical window of the scanner, packages flow from the operator's right to left. The packages are in queue on the conveyor to the right and the bagging is to the left.

UNPACKING THE UNIT

1. Make sure the shipping box is top-side up before opening.

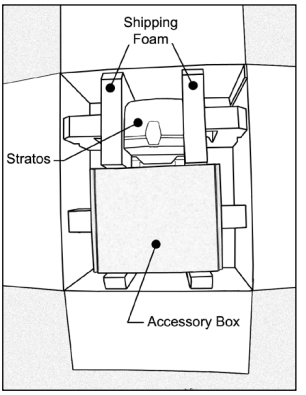


Figure 23.

2. Remove the accessories box and check it's content for the following items.

   - Remote Display (Optional), Qty. 1
   - Programming Guide, Qty. 1
   - Installation and User's Guide, Qty. 2
   - Power Supply, Qty. 1
   - Communication Cables, Qty. Application Dependent

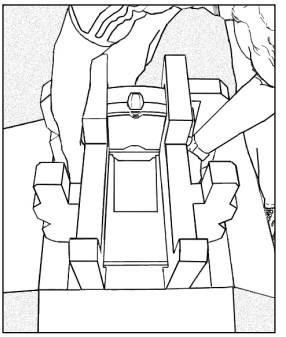


Figure 24.

3. Lift the scanner out of the shipping box by gripping the **bottom** of the unit on both sides.

   Important! **Do not** lift the unit out of the box by gripping the sides of the platter.

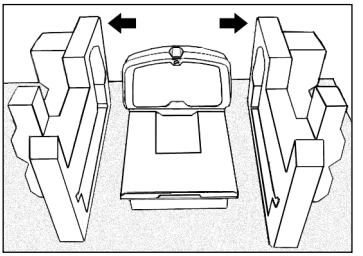


Figure 25.

4. Carefully remove the shipping foam around the unit.

   Important! **Do not** turn the unit upside down or tilt the unit onto its side while removing the shipping foam. The platter is not attached to the unit and can fall off!

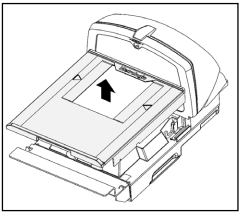


Figure 26.

5. Lift the platter off the unit and store it in a safe location until the unit has been installed in the checkstand counter.

INSTALLING THE UNIT IN THE COUNTER

Proper Lifting Technique

On every Stratos model there are two lifting handles located under the removable platter. These handles are provided to assist in installation when placing the unit in the checkstand cutout.

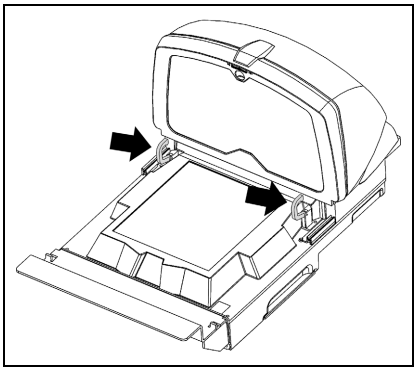


Figure 27. Lifting Handles

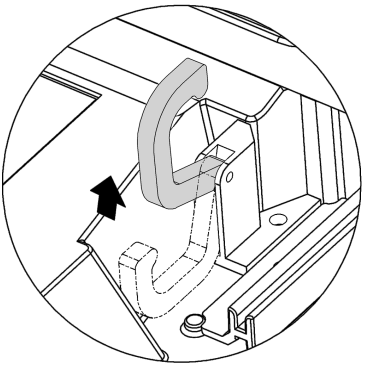


Figure 28. Rotate Handles Up

When lifiting the unit with these handles it is important to rest your thumbs against the front surface of the vertical window frame. If you do not do this the unit will tilt toward you when it is lifted. This makes installation difficult and increases the risk of dropping the scanner.

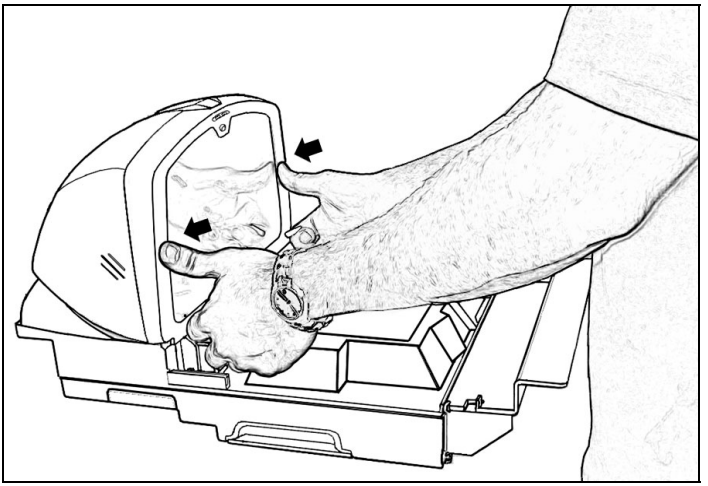
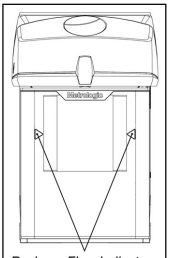


Figure 29. Rest Thumbs Against Vertical Frame

INSTALLING THE UNIT IN THE COUNTER

For the MS2020 and the MS2021 (Full Size Units)

There are two options for mounting your MS2020/MS2021 scanner. *Option A,* is a two-point mounting system that supports the unit at the front and back. *Option B*, is a three-point mounting system that supports the unit at the back and on the sides.



Before starting to mount the MS2020/MS2021 determine:

- The scanner's orientation in reference to the operator and the direction of package flow.
- The mounting method that provides the most stability for the scanner.
- If any additional materials or tools are required for installation.

Option A: Two-point support.

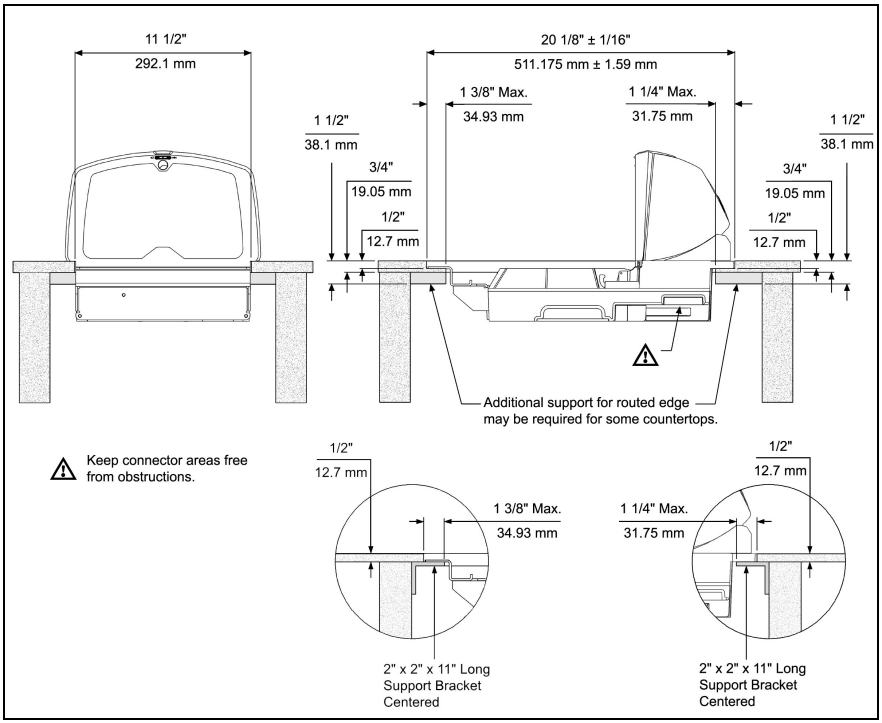


Figure 30. Option A, Two-Point Support

INSTALLING THE UNIT IN THE COUNTER

Option B: Three-point support.

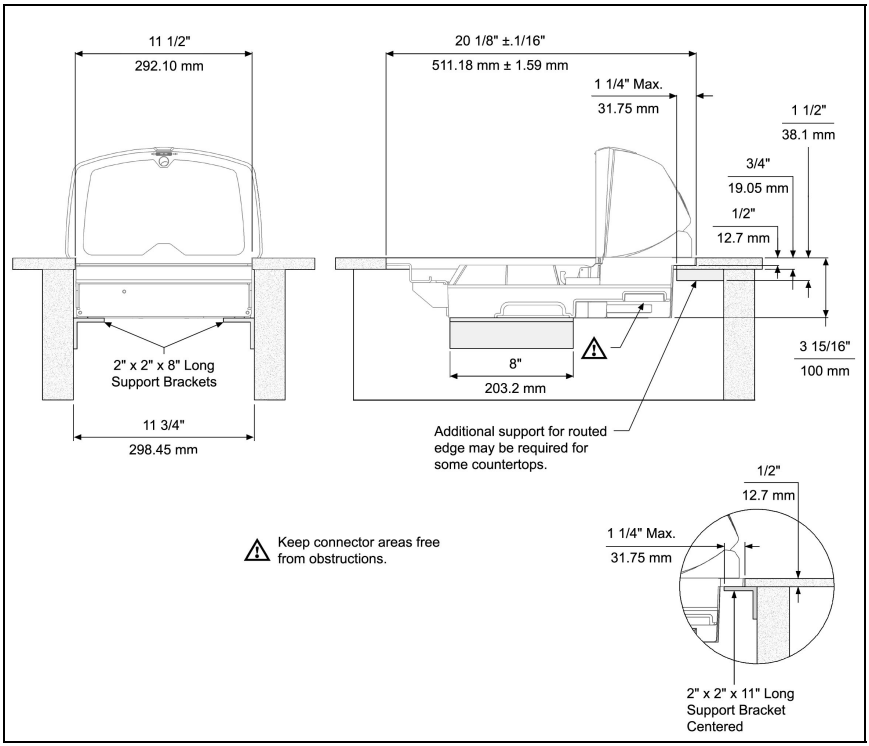


Figure 31. Option B, Three-Point Support

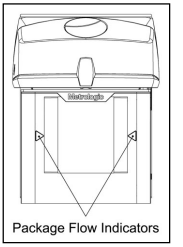
INSTALLING THE UNIT IN THE COUNTER

For the MS2022 (Compact Size Unit)

There are two options for mounting your MS2022 scanner. *Option A,* is a two-point mounting system that supports the unit at the front and back. *Option B*, is a three-point mounting system that supports the unit at the back and on the sides.

Before starting to mount the MS2022 determine:

- The scanner's orientation in reference to the operator and the direction of package flow.
- The mounting method that provides the most stability for the scanner.
- If any additional materials or tools are required for installation.



Option A: Two-point support.

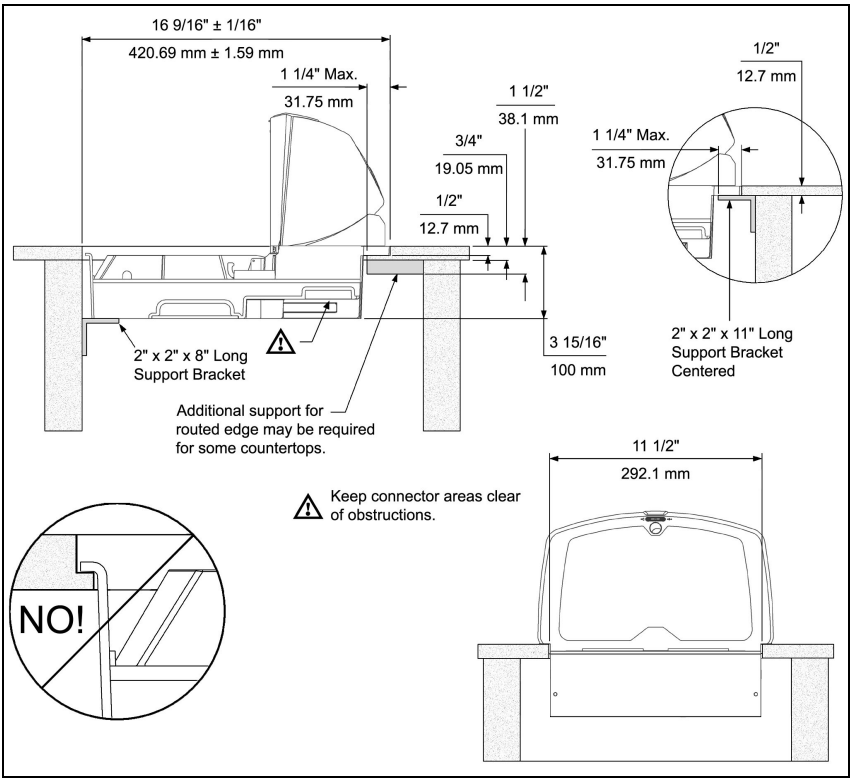


Figure 32. Option A, Two-Point Support

INSTALLING THE UNIT IN THE COUNTER

For the MS2022 (Compact Size Unit)

Option B: Three-point support.

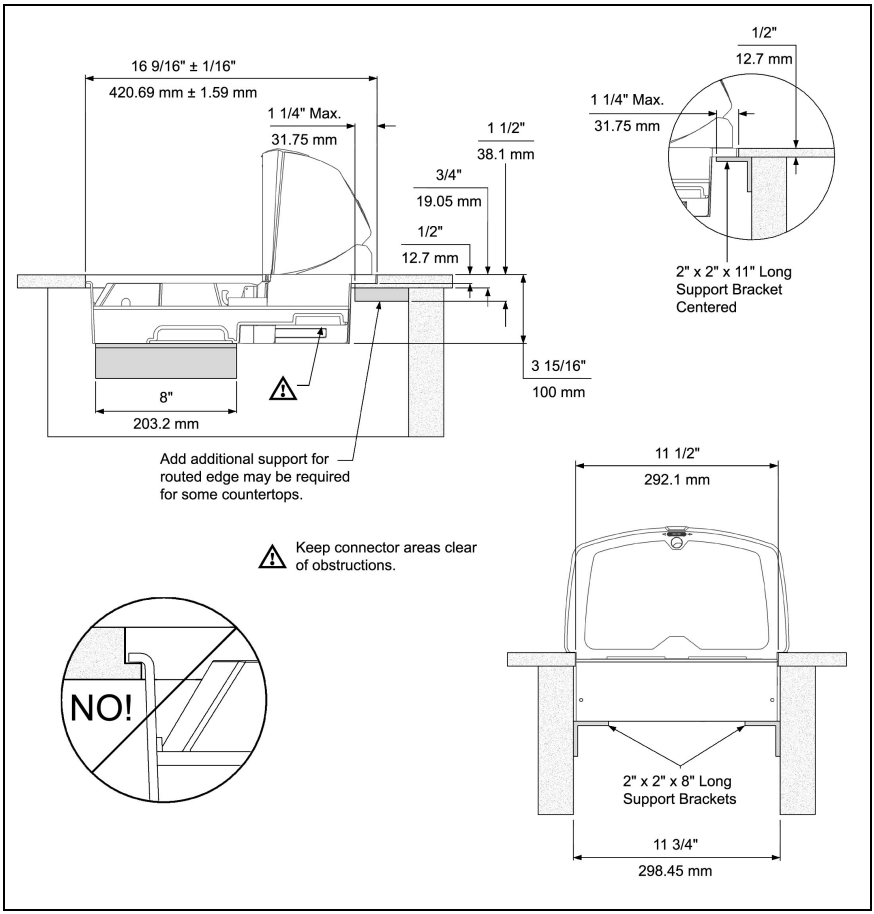


Figure 33. Option B, Three-Point Support

INTERFACE

RS232

1. Turn off the host system.

2. Connect the RS232 interface cable to the 1st 10-pin socket on the bottom of the scanner near the serial number label. Refer to figure 34 on page 33.

3. Connect the other end of the RS232 interface cable to the host device.

   Before continuing, verify that the RS232 interface cable is connected to the appropriate interface jack on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

4. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 7.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 34 on page 33.

5. Connect the other end of the scale/host cable to the host device.

6. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

7. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

   Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

8. Connect AC power to the transformer.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

RS232

9. Scan the recall defaults and enable RS232 bar codes to configure the MS202x for RS232.

Scan 1st

Recall Defaults

Scan 2nd

Enable RS-232

10. Turn on the host system.

INTERFACE

RS232

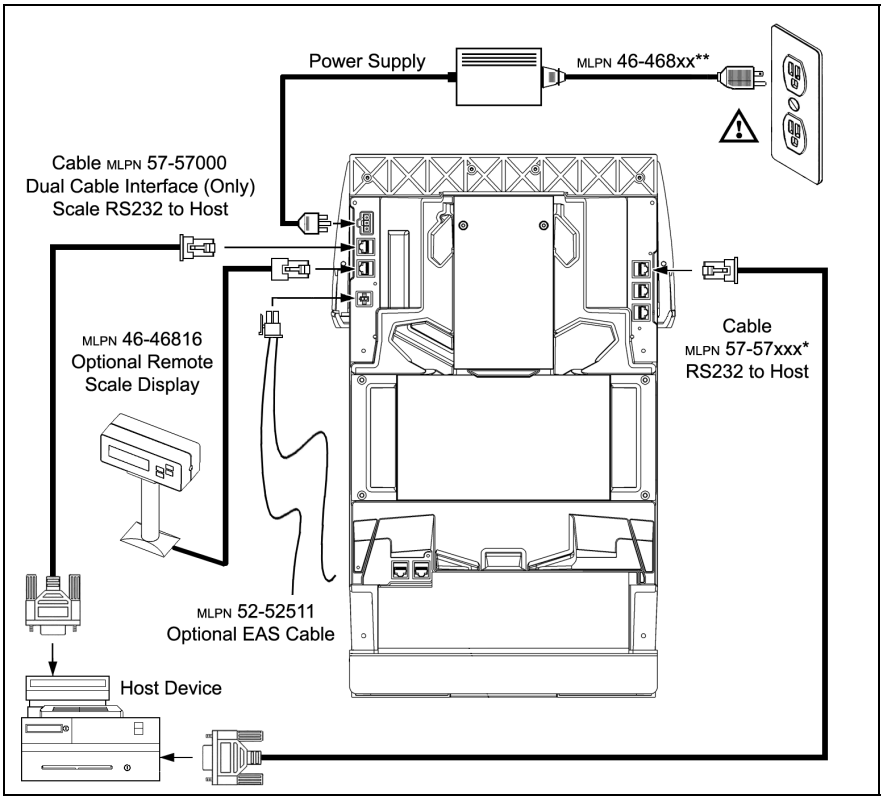


Figure 34. RS232 Interface Cable Installation Schematic

xxx* Specifies connection to the host. Contact a Metrologic representative for additional information.

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

FULL SPEED USB (INTEGRATED)

1. Turn off the host system.

2. Connect the USB interface cable to the 2nd 10-pin socket on the bottom of the scanner near the serial number label. Refer to figure 35 on page 36.

3. Connect the other end of the USB interface cable to the host.

Before continuing verify that the USB interface cable is connected to the appropriate socket on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

Manufacturers Note:
Plugging the scanner into the USB port of the PC does not guarantee that scanned information will appear at the PC. A software driver and correct configuration setting are also required for proper communication to occur.

4. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 7.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 35 on page 36.

5. Connect the other end of the scale/host cable to the host device.

6. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

7. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

INTERFACE

FULL SPEED USB (INTEGRATED)

8. Connect AC power to the transformer.

9. Scan the *Enable Full Speed USB Defaults* bar code to configure the MS202x for USB communication.

Enable
Full Speed USB Defaults

10. Turn on the host system.

Caution:	To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.
⚠	To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

FULL SPEED USB (INTEGRATED)

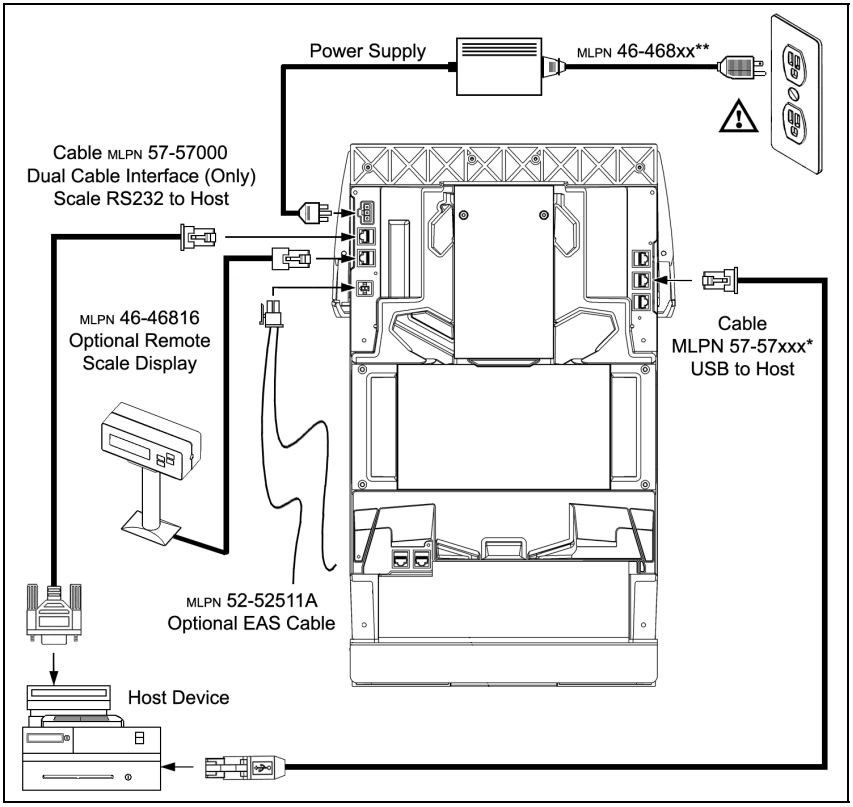


Figure 35. USB Cable Installation Schematic

xxx* Specifies connection to the host. Contact a Metrologic representative for additional information.

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

LOW SPEED USB (EXTERNAL WITH MX009)

1. Turn off the host system.

2. Connect the USB/MX009 interface cable to the 2nd 10-pin socket on the bottom of the scanner near the serial number label. Refer to figure 36 on page 39.

3. Connect the other end of the USB/MX009 interface cable to the host.

Before continuing verify that the USB interface cable is connected to the appropriate socket on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

Manufacturers Note:
Plugging the scanner into the USB port of the PC does not guarantee that scanned information will appear at the PC. A software driver and correct configuration setting are also required for proper communication to occur.

4. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 7.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 36 on page 39.

5. Connect the other end of the scale/host cable to the host device.

6. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

7. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

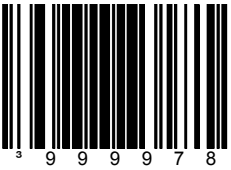
INTERFACE

LOW SPEED USB (EXTERNAL WITH MX009)

8. Connect AC power to the transformer.

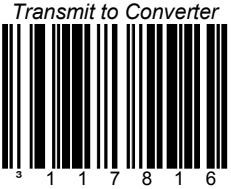
9. Scan the *Enable USB Defaults* bar code to configure the MS202x for USB communication.

Enable USB Defaults



10. Scan the *Transmit to Converter* bar code to configure the MS202x for the MX009.

Transmit to Converter



11. Turn on the host system.

Caution:	To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.
⚠	To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

LOW SPEED USB (EXTERNAL WITH MX009)

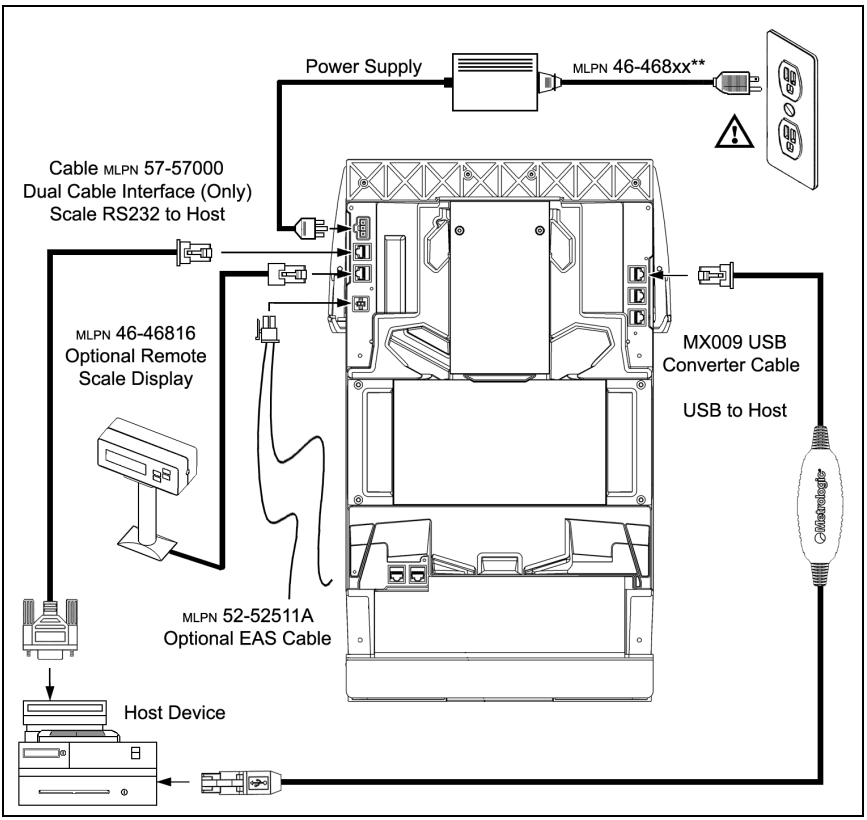


Figure 36. USB Cable Installation Schematic

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

IBM 46xx

1. Turn off the host system.

2. Connect the MVC cable to the 1st 10-pin socket on the bottom of the scanner near the serial number label. Refer to figure 37 on page 42.

3. Connect the other end of the IBM cable to the host.

   Before continuing verify that the MVC cable is connected to the appropriate interface jack on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

   Manufacturers Note:
   Plugging the scanner into the serial port of the PC does not guarantee that scanned information will appear at the PC. A software driver and correct configuration settings are also required for proper communication to occur.

4. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 7.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 37 on page 42.

5. Connect the other end of the scale/host cable to the host device.

6. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

7. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

   Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

IBM 46xx

8. Turn on the host system.

9. Scan the *Load 46xx IBM Defaults* bar code to configure the MS2020 for IBM 46xx communication.

Load 46xx IBM Defaults

For additional communication options for IBM interfaces refer to the MetroSelect Programming Guide (MLPN 00-02407).

INTERFACE

IBM 46xx

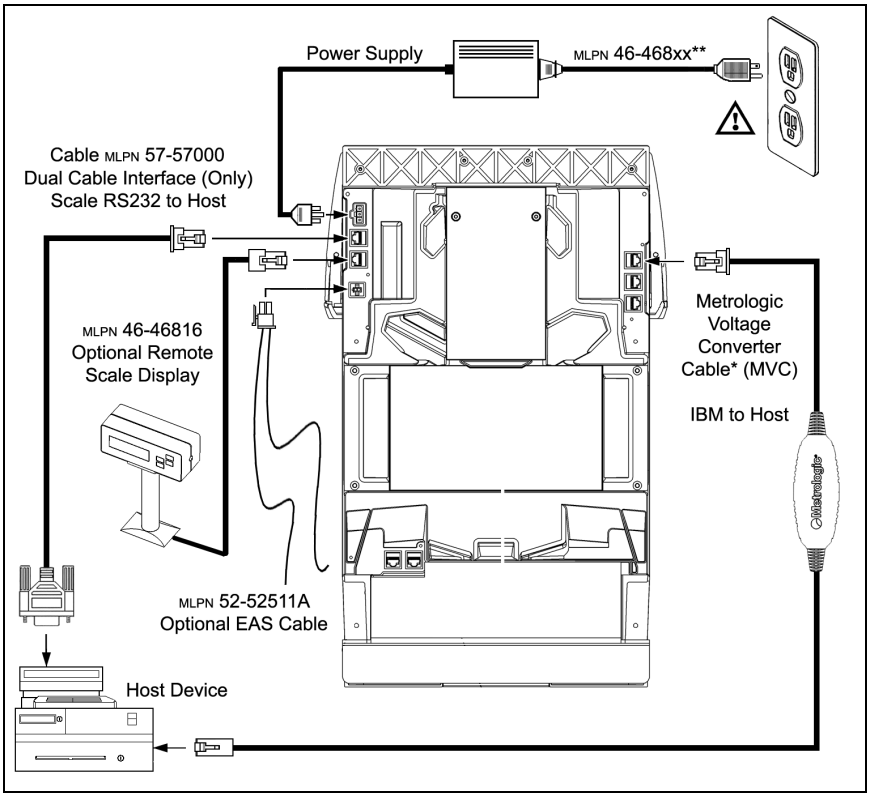


Figure 37. IBM Cable Installation Schematic

* Host end connection is application dependent. Contact a Metrologic Customer Service representative for additional information on Metrologic's MVC Cable series and the host connections available.

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

OCIA

1. Turn off the host system.

2. Connect the OCIA interface cable to the 2nd 10-pin socket on the bottom of the scanner near the serial number label. Refer to figure 38 on page 45.

3. Connect the other end of the OCIA Interface cable to the host.

   Before continuing verify that the OCIA cable is connected to the appropriate interface jack on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

   Manufacturers Note:
   Plugging the scanner into the serial port of the PC does not guarantee that scanned information will appear at the PC. A software driver and correct configuration settings are also required for proper communication to occur.

4. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 7.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 38 on page 45.

5. Connect the other end of the scale/host cable to the host device.

6. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

7. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

   Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

INTERFACE

OCIA

8. Turn on the host system.

9. Scan the *Load OCIA Defaults* bar code to configure the MS2020 for OCIA communication.

Load OCIA Defaults

For additional communication options for OCIA interfaces refer to the MetroSelect Programming Guide (MLPN 00-02407).

Caution:	To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.
⚠	To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTERFACE

OCIA

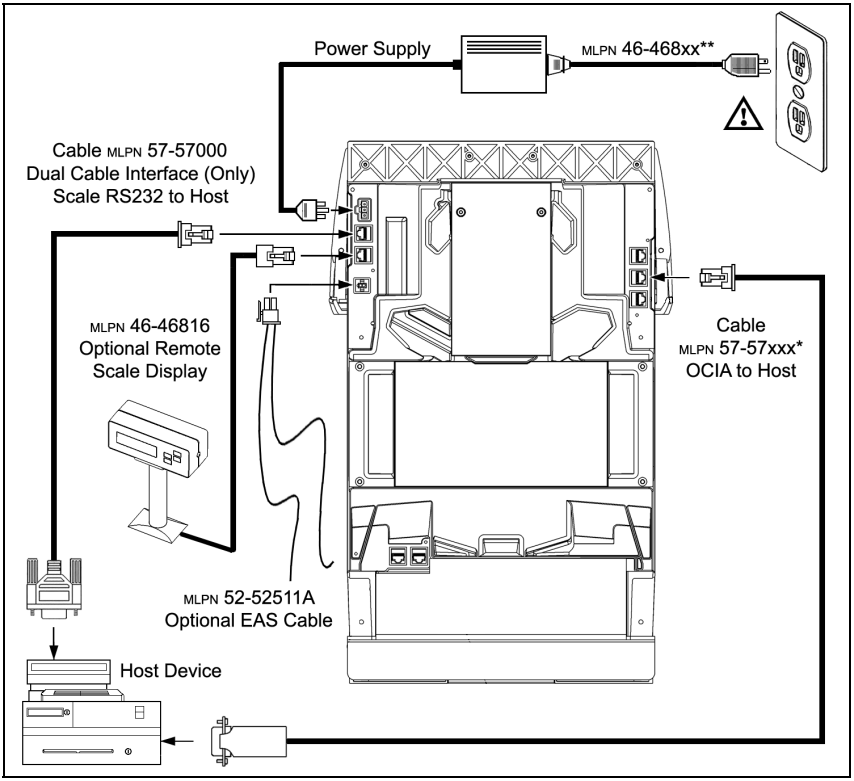


Figure 38. OCIA Cable Installation Schematic

xxx* Specifies connection to the host. Contact a Metrologic representative for additional information.

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

INTEGRATED SCALE ON SINGLE CABLE SCANNER/SCALE SYSTEM

The following bar codes configure the scanner as to the current configuration of the scale. The scale operation can be integrated into the software of Stratos. Presently, the scale cannot be configured from the scanner. The scale is configured with a down load file/utility on the PC. The following bar codes are to let the scanner know the configuration of the scale so it can refute commands that do not make sense to the scale configuration, if needed.

Use the *English Scale Defaults* bar code to lay a template of English mode operation into the scanner's memory. This will not change scanner defaults. This bar code activates the scale in 4-digit weigh mode (xx.yy lbs.), sets the scale to English mode, and sets display required.

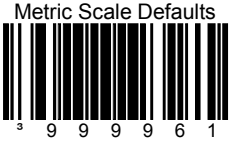
English Scale Defaults

5-Digit Weight

When it is desired to give the English mode weight in 5 digits (xx.yyy lbs.), scan the *5-Digit Weight* bar code after the English scale defaults above.

For Metric mode operation, use the *Metric Scale Defaults* bar code. It activates the scale in scanner memory in 5-digit weight mode, sets the scale to Metric mode, and display required.

Metric Scale Defaults



*No Scale

When it is desired to remove the scale from the scanner's configuration or the scale resides in a dual cable system, use the *No Scale* bar code. The scanner will not attempt to communicate with the scale as a default condition or after this bar code has been scanned.

Scan the *No Display* bar code when no Metrologic remote display is required with the scanner/scale.

No Display

SECONDARY SCANNER

> Stratos' auxiliary port will support 5VDC devices with a 200mA maximum current. If the auxiliary device exceeds this specification an external power supply will be required to power the auxiliary device.
>
> The following Metrologic scanners can receive power from Stratos: the MS9520, MS9540, MS6720, MS6220 and the MS5145.
>
> The MS6520, MS7120, MS7220, MS7320, MS7600 and MS2020 require the use of Auxiliary PowerLink cable MLPN 54-54667.

1. Turn off the host system.

2. Connect the **round** end of the RS232 AUX cable to the RS232 socket of the **secondary** scanner (*see figure 39 on page 5*0).

3. Connect the other end of the RS232 AUX cable to the **3rd** 10-pin socket on the bottom of the MS202x, near the serial number label.

   Important: The MS2020 series' aux port requires the signals; transmit, receive, RTS & CTS from the secondary scanner.

4. **This step is required for secondary devices that require >5VDC and/or 200mA current to operate.** Skip to step 5 if the secondary device requires ≤ 5VDC.

   Plug the power supply into the secondary scanner's PowerLink cable (MLPN 54-54667).

   > Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

5. Connect the MS2020/Host interface* cable to the appropriate jack on the bottom of the MS2020.

6. Connect the other end of the MS2020/Host interface cable to the host.

   > STOP Before continuing verify that the interface* cable is connected to the appropriate jack on the scanner. An incorrect cable connection can cause communication problems or potential damage to the scanner.

SECONDARY SCANNER

> *Manufacturers Note:*
> Plugging the scanner into the serial port of the PC does not guarantee that scanned information will appear at the PC. A software driver and correct configuration settings are also required for proper communication to occur.

7. Steps 4 through 6 are for MS2020 scanner/scales using dual cable interfaces where the scale is connected to the host with a separate communication cable. If your Stratos model does not include a scale skip to step 10.

   Connect the scale/host cable to the 1st 10-pin socket on the bottom of the scanner next to the 3-pin Molex plug. Refer to figure 39 on page 50.

8. Connect the other end of the scale/host cable to the host device.

9. Connect the *optional* remote display cable to the 2nd 10-pin socket on the bottom of the scanner near the 3-pin Molex plug.

10. Connect the external power supply to the 3-pin Molex plug on the bottom of the scanner farthest away from the serial number label.

> Check the AC input requirements of the power supply to make sure the voltage matches the AC outlet. The outlet should be located near the equipment and be easily accessible.

11. Connect AC power to the Stratos transformer and the secondary scanner if applicable.

> **Caution:** To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.
>
> To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

12. Configure the MS2020 for the appropriate interface configuration settings*.

> * The MS2020/host cable connection is interface dependent. Refer to the installation steps provided for the type of interface *(RS232, IBM 46xx, etc.)* required for your application.

SECONDARY SCANNER

13. Scan the following bar code to configure the auxiliary port on the MS2020 to accept a Metrologic scanner as the secondary scanner.

> The following bar codes **do not apply** when using an MS6720 as a secondary scanner. Contact a Metrologic representative for additional information on the MS6720. If the secondary scanner is not a Metrologic scanner refer to Section O of the MetroSelect Configuration Guide.

Enable Aux Port

> The auxiliary input port's data format must match the main output format of the secondary scanner.

14. Scan the following bar codes, in order, to configure the secondary scanner to match the auxiliary port's data format.

1st
Enable AUX Output

2nd
Secondary Scanner Data Format

3rd
Enable Comm Timeouts

4th (Optional)
Turn OFF Secondary Scanner's Beeper

15. Turn on the host system.

SECONDARY SCANNER

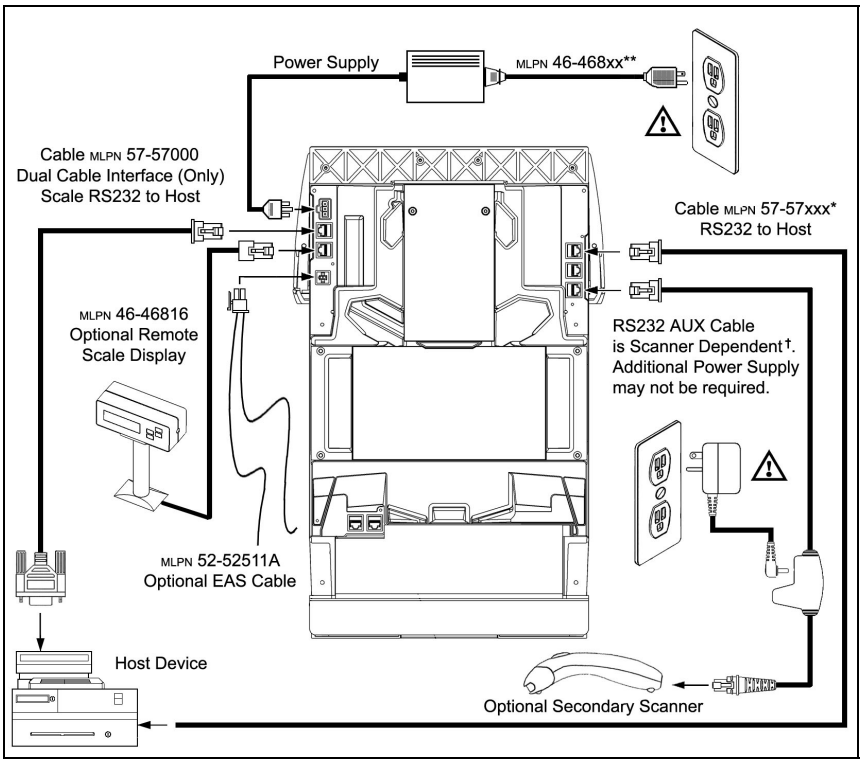


Figure 39. Secondary Scanner Cable Installation Schematic

xxx* Specifies connection to the host. Contact a Metrologic representative for additional information.

The MS202x/host cable connection is interface dependent. Refer the installation steps provided for the type of interface required for your application.

xx** Specifies international connection. See the Base Kit Components and Optional Accessories section of this guide for a complete listing.

† See page 47 for Aux Power Specifications

Caution: To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950.

To maintain compliance with standard CSA C22.2 No. 60950/UL 60950 and norm EN/IEC 60950, the power source should meet applicable performance requirements for a limited power source.

EAS DEACTIVATION

SW1 and SW2 are the switch banks inside the CheckPoint Device that set the deactivation range. The following is a list of CheckPoint recommended switch bank settings.

Base Model	CheckPoint Recommended Switch Bank Settings
MS2020	SW1 & SW2 switches 1 and 6 set to ON
MS2021	SW1 & SW2 switches 1 and 6 set to ON
MS2022	SW1 & SW2 switches 1 and 6 set to ON

All models have a connector (*marked EAS In*) on the bottom of the scanner/scale. Metrologic provides an EAS cable (MLPN 52-52511A) for connection between the scanner/scale and the Checkpoint Device.

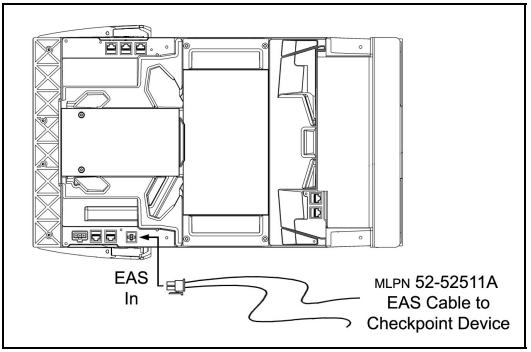


Figure 40. EAS Cable Connection (Bottom of Stratos)

The following figure shows the location of the EAS deactivation area for Stratos. It is important to pass the entire tag through this area to deactivate the security tag.

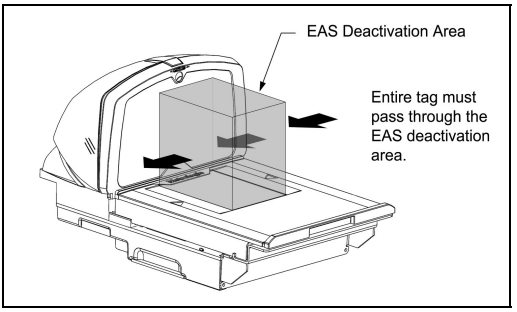


Figure 41. EAS Deactivation Area

SCAN ZONE

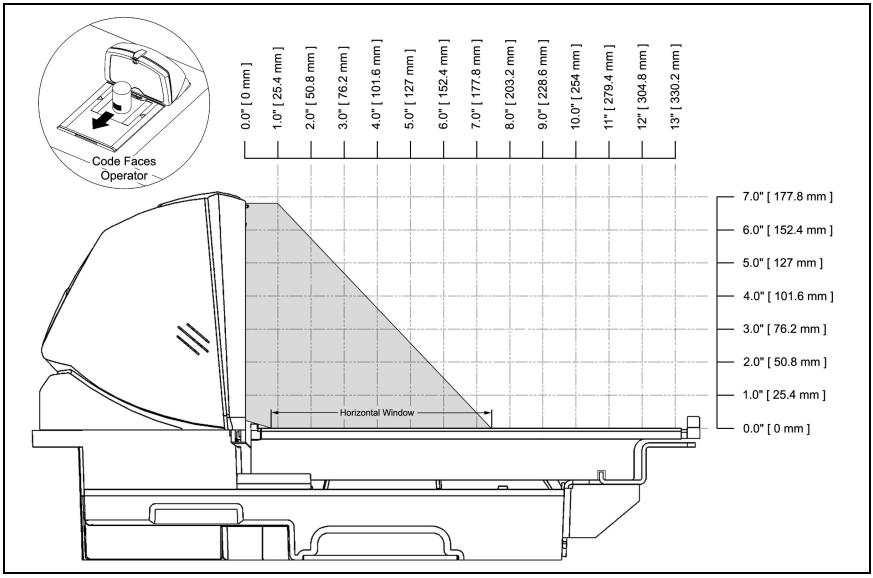


Figure 42. Checker-Side (13 mil)

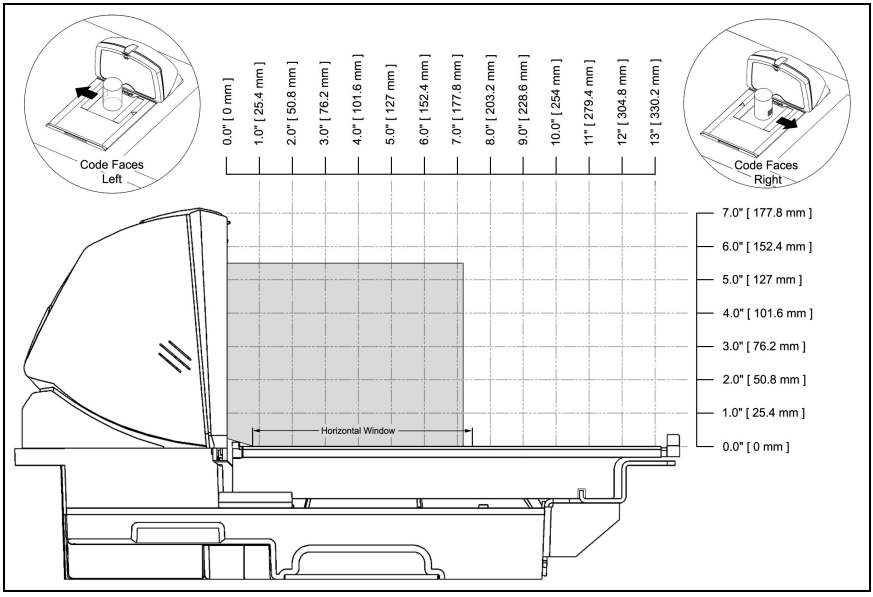


Figure 43. Horizontal Left/Right (13 mil)

SCAN ZONE

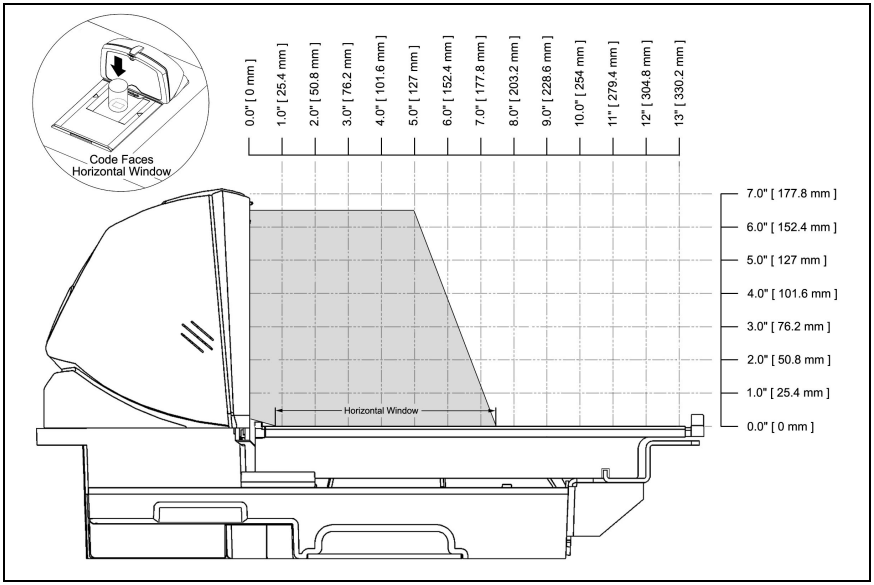


Figure 44. Horizontal Direct (13 mil)

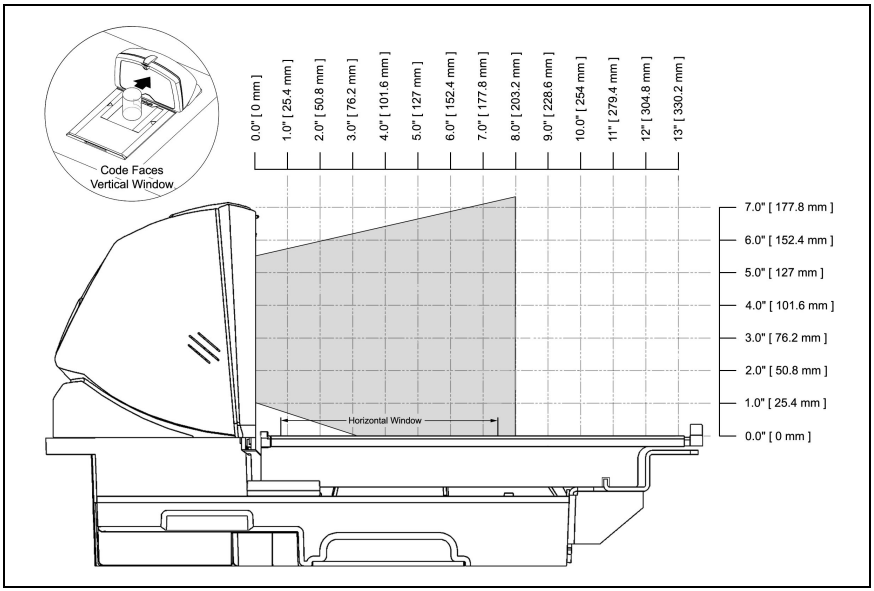


Figure 45. Vertical Direct (13 mil)

SCAN ZONE

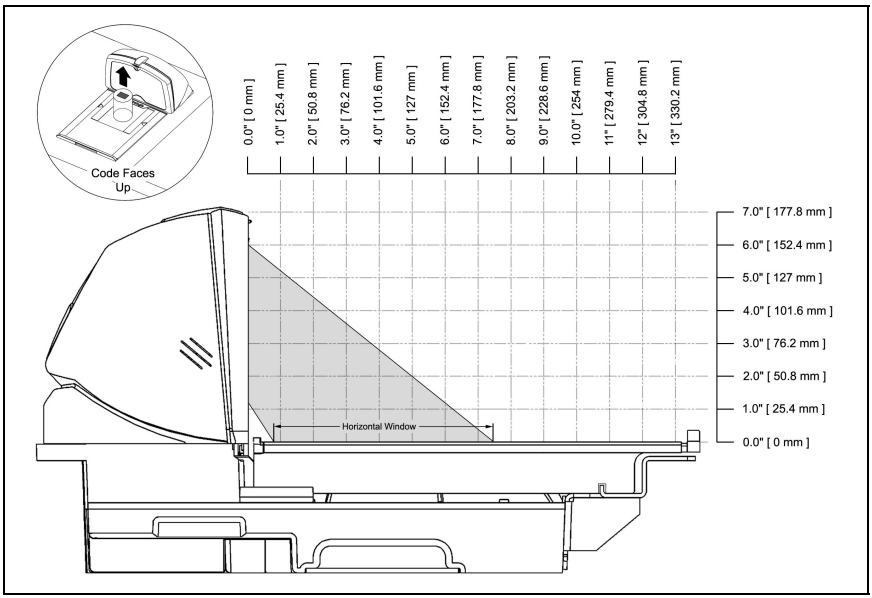


Figure 46. Top-Down (13 mil)

IR ACTIVATION AREA

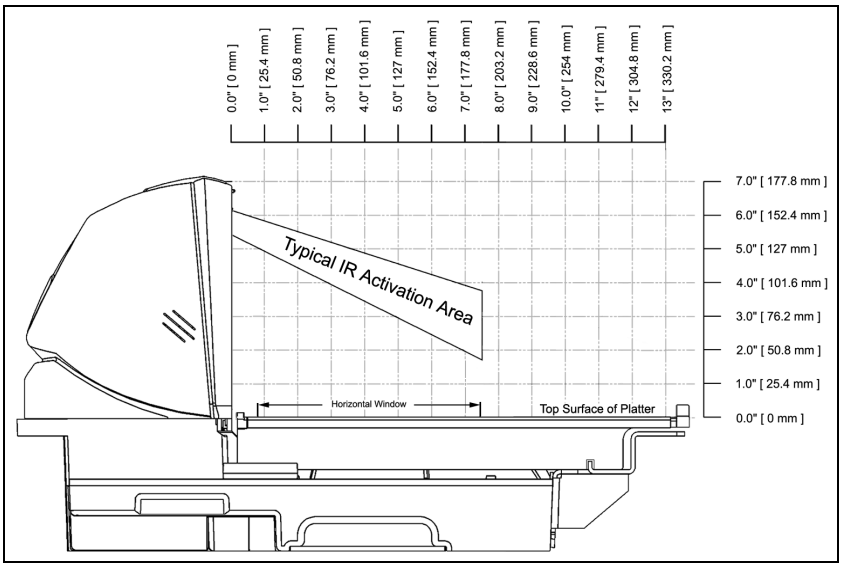


Figure 47. IR Activation Area Perpendicular to Package Flow

INDICATOR DESCRIPTIONS

Audible

When the MS2020 is in operation, it can provide audible feedback. These sounds indicate the status of the scanner. Eight settings are available for the tone of the beep (normal, 6 alternate tones and no tone) plus three volume settings. To change the tone or volume, refer to the *Changing the Beeper Tone & Volume* section of this manual.

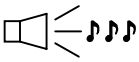
One Beep

When the scanner *first* receives power the white LED will flash, the blue LED will turn on and the scanner will beep once (*the white LED will remain on for the duration of the beep*). The scanner is now ready to scan.

When the scanner *successfully* reads a bar code, the white LED will flash and the scanner beeps once (*if programmed to do so*). If the scanner does not beep once and the white light does not flash, then the bar code has *not* been successfully read.

Razzberry Tone

This is a failure indicator. Refer to failure modes page 58.

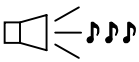


Three Beeps - during operation

When placing the scanner in program mode, the white LED will flash while the scanner simultaneously beeps three times. The white and blue LEDs will continue to flash until the unit exits program mode. Upon exiting program mode, the scanner will beep three times and the white LED will stop flashing.

When configured, 3 beeps can also indicate a communications timeout during normal scanning mode.

When using one-code-programming, the scanner will beep three times (the current selected tone), followed by a short pause, a high tone and a low tone. This tells the user that the single configuration bar code has *successfully* configured the scanner.



Three Beeps - on power up

This is a failure indicator. Refer to failure modes page 58.

INDICATOR DESCRIPTIONS

Visual

There is an array of LEDs (white and/or blue) located on the top of the hood of the MS202x. When the scanner is on, the flashing or constant illumination of the LEDs indicates the status of the current scan and the scanner.

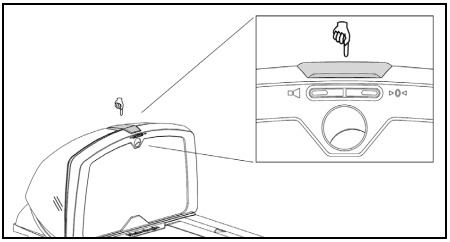


Figure 48. LEDs

No White or Blue LED

The LEDs will not be illuminated if the scanner is not receiving power from the host or transformer. They are also not illuminated when all lasers are turned off for any reason.

Steady Blue

When all lasers are active, the blue LED is illuminated. The blue LED will remain illuminated until all lasers are deactivated.

Steady Blue and Single White Flash

When the scanner successfully reads a bar code, the white LED will flash and the scanner will beep once. If the white LED does not flash or the scanner does not beep once, then the bar code has not been successfully read.

Steady White and Blue

After a successful scan, the scanner transmits the data to the host device. Some communication modes require that the host inform the scanner when data is ready to be received. If the host is not ready to accept the information, the scanner's white LED will remain on until the data can be transmitted.

INDICATOR DESCRIPTIONS

Visual

Flashing Blue then Flashing White

This indicates the scanner is in program mode. A razzberry tone indicates that an invalid bar code has been scanned in this mode.

or

If the unit is in sleep mode, each LED will flash once every 15 seconds.

Steady White, Blue Off

This indicates the scanner may be waiting for communication from the host.

INDICATOR DESCRIPTIONS

Failure

Flashing Blue and One Razzberry Tone

This indicates that the scanner has experienced a laser subsystem failure. The scanner will try up to 3 times to correct the failure condition. If the laser subsystem continues to fail, that subsystem (horizontal or vertical) will be shut down and an error indication will be shown on the Diagnostic Indicator Display. This error stays on the display until corrected. If the remaining subsystem is still operational, scanning will continue using the operational components!

Flashing Blue and White and Two Razzberry Tones

This indicates that the scanner has experienced a laser subsystem failure. The scanner will try up to 3 times to correct the failure condition. If the laser subsystem continues to fail, that subsystem (horizontal or vertical) will be shut down and an error indication will be shown on the Diagnostic Indicator Display. This error stays on the display until corrected. If the remaining subsystem is still operational, scanning will continue using the still operational components!

Continuous Razzberry Tone with both LEDs off

If, upon power up, the scanner emits a continuous razzberry tone, then the scanner has an electronic failure. Return the unit for repair at an authorized service center.

Three Beeps - on power up

If the scanner beeps 3 times on power up then, the nonvolatile memory that holds the scanner configuration has failed. Return the unit for repair at an authorized service center.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

This error display consists of a pair of seven-segment numerical displays for relating numerical error codes to the operator. It is located under the platter near the bottom right corner of the output window. The following is a list of possible error codes and their meanings. Some errors will require immediate scanner maintenance.

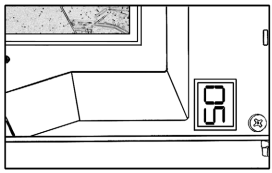


Figure 49. Error Code Display

Error Code	Description
01	Reserved
02	RAM ERROR – The scanner's Random Access Memory (RAM) is tested as faulty. Return the unit for repair at an authorized service center.
03	PROGRAM ERROR – The scanner's software program is failing. Return the unit for repair.
04	INTERFACE ERROR – After power up and any application exit (e.g. MetroSet, etc.), the scanner checks the interface hardware with that chosen in configuration. If they do not agree, an interface error exists. Correct this problem by getting the proper hardware interface OR programming Stratos configuration for the proper interface hardware attached.
05	CONFIGURATION ERROR – The non-volatile configuration memory did not agree with the data last saved. Default configuration data is then used and the scanner continues operating. This error is also accompanied by 3 beeps. This error will remain during operation as a reminder that this power cycle is scanning against a default-generated configuration.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

Error Code	Description
11	SWITCH ERROR – The switch used for volume selection or sleep mode is detected in error (always closed). The condition is self-correcting if possible. If the error persists, return the unit for repair at an authorized service center. The scanning operation can continue with this error active.
12	Reserved
13	SCALE ERROR – Single Cable Scanner/Scales Only. The scanner does not communicate with the scale. Make sure there is nothing plugged into the '*Scale RS232 to Host*' port. If there is disconnect the cable, it may be causing the communication error. If there is still no communication between the scanner and scale return the unit to authorized service center for repair.
21	LASER #1 (vertical) ERROR – The laser in the vertical scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, the vertical scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators. If the horizontal scanning subsystem is still healthy, it will remain active and scanning can CONTINUE using the remaining good subsystem! The unit, however, should be scheduled for repair at an authorized service center when convenient.
22	LASER #2 (right horizontal) ERROR – The right laser in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, and the left horizontal laser (#3) is also in error, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators. If the left (Laser #3) horizontal scanning subsystem is still healthy, the horizontal scanning subsystem remains active and scanning can CONTINUE using the remaining good components! The unit, however, should be scheduled for repair at an authorized service center when convenient.

INDICATOR DESCRIPTIONS

Diagnostic Indicator Display

Error Code	Description
23	LASER #3 (left horizontal) ERROR – The left laser in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the laser error persists, and the right horizontal laser (#2) is also in error, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators. If the right (Laser #2) horizontal scanning subsystem is still healthy, the horizontal scanning subsystem remains active and scanning can CONTINUE using the remaining good components! The unit, however, should be scheduled for repair at an authorized service center when convenient.
31	MOTOR #1 (vertical) ERROR – The motor in the vertical scanning subsystem denotes a failure. The scanner will try three times to correct the motor operation. If the motor error persists, the vertical scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators. If the horizontal scanning subsystem is still healthy, it will remain active and scanning can CONTINUE using the remaining good subsystem! The unit, however, should be scheduled for repair at an authorized service center when convenient.
32	MOTOR #2 (horizontal) ERROR – The motor in the horizontal scanning subsystem denotes a failure. The scanner will try three times to correct the laser operation. If the motor error persists, the horizontal scanning subsystem will be shut down and this error code will remain on the Diagnostic Indicators. If the vertical scanning subsystem is still healthy, it will remain active and scanning can CONTINUE using the remaining good subsystem! The unit, however, should be scheduled for repair at an authorized service center when convenient.

POWER SAVE MODES

The MS2020 has five programmable power save modes. Refer to the *MetroSelect Programming Guide* for additional information on Power Save Modes.

1. **Blink Power Save Mode:**

   Blinks the laser OFF & ON after a programmed period of non-use.

   When the scanner recognizes a bar code it will exit the Blink mode.

2. **Laser Off Power Save Mode:**

   Turns the laser OFF after a programmed period of non-use. The motor continues to spin allowing for a faster "wake" up time.

   Any movement detected by the IR will "wake" the scanner from the *Laser Off* power save mode (see figure 46 on page 54).

3. **Laser & Motor Off Power Save Mode:**

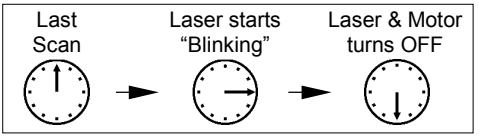
   Turns the laser and motor OFF after a programmed period of non-use.

   Any movement detected by the IR will "wake" the scanner from the power save mode (see figure 46 on page 51). This mode's "wake" time is slightly longer due to the motor's need to restart.

4. **Dual Action Power Save Mode #1:**

   "Blinks" the laser OFF & ON after a programmed period of non-use turns the laser and motor OFF at thirty-minute intervals.

Example:
If the power save timeout is set to 15 minutes.



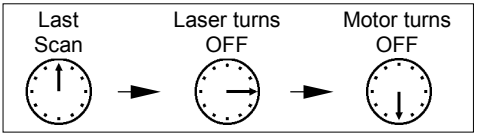
Any movement detected by the IR will "wake" the scanner from the power save mode (see figure 46 on page 51).

POWER SAVE MODES

5. **Dual Action Power Save Mode #2 (Default):**

   Turns the laser OFF after a programmed period of non-use then turns the motor OFF after thirty-minute intervals.

   Example:
   If the power save timeout is set to 15 minutes.



   Any movement detected by the IR will “wake” the scanner from the power save mode (see figure 47 on page 51).

BEEPER OPTIONS AND BUTTON FUNCTIONS

Changing the Beeper Tone

Beeper tones may be programmed directly or incrementally using the following bar code. The new tone will be heard followed by a short pause. Two more new tones will be heard signifying the new setting has been stored in memory. The silent (no beep) tone is also selectable.

Next Beep Tone

Changing the Beeper Volume

Volume levels may be programmed directly or incrementally using the following bar code. The new volume will be heard followed by a short pause. Two more tones will be heard signifying the new setting has been saved in memory. The silent (no volume) tone is also selectable.

Next Volume

BEEPER OPTIONS AND BUTTON FUNCTIONS

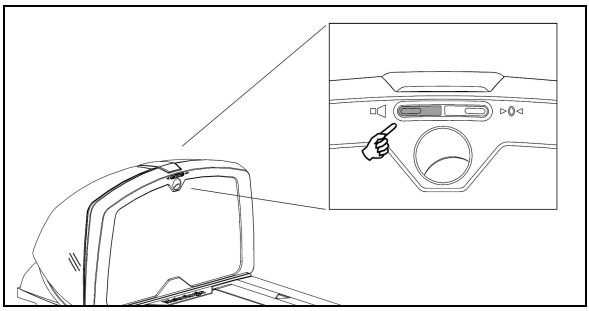


Figure 50. The Multi-Function Volume Button

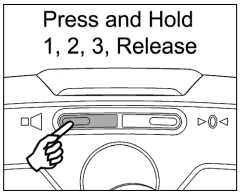


Figure 51. Changing the Beeper

Changing the Beeper Tone

A short (<3 second) depression and the beeper volume will change. The new volume will be heard, followed by a short pause. Then two more of the tones will be heard signifying the new setting has been stored in memory. The silent (no beep) volume is also selectable.

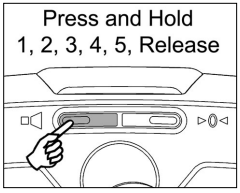


Figure 52. Laser & Motor Off Power Save

Placing the Unit in Laser & Motor Off Power Save Mode

Long (>3 seconds) depression
The *Laser & Motor Off Power Save Mode* is the only power save mode that can be activated with the multi-function button.

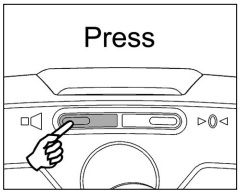


Figure 53. Normal Operation

Waking the Unit from All Power Save Modes

The next button depression will awaken the scanner for normal operation.

STARTUP

When the scanner *first* receives power the white LED will flash, the blue LED will turn on and the scanner will beep once (*the white LED will remain on for the duration of the beep*). The scanner is now ready to scan.

POWER-UP TEST MODE

When a Stratos scanner is first powered up, it cycles through a number of self-tests before starting normal operation. If there are any initial failures during this sequence of tests the scanner will beep or razz to indicate the error and an error code will appear in the diagnostic indicator display.

The following are examples of the types of tests performed at power-up.

1. Memory tests
2. Hardware setup tests
3. Motor tests
4. Laser tests
5. Configuration tests
6. Interface tests

These tests are also performed on a periodic basis with the operator alerted to any failures.

PROGRAMMING MODE

All MS2020 series scanners have been configured at the factory with a set of default communication protocols. Since many host systems have unique formats and protocol requirements, Metrologic provides a wide range of configurable features that may be selected with the use of the MetroSelect® Configuration Guide (MLPN 00-02407) or MetroSet.

For a complete list of the factory default settings, refer to the *Default Settings* section of this guide.

SCALE ZEROING

After the unit has been officially calibrated (see page 67) the scale can be re-zeroed by pressing the scale zeroing button on either the unit or on the remote display stand. Refer to the figures below for button locations.

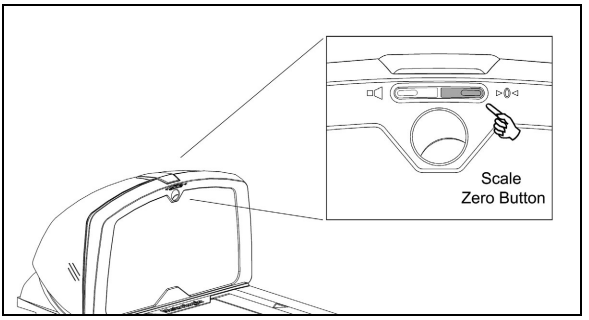


Figure 54. The scale zero button on scanner/scale.

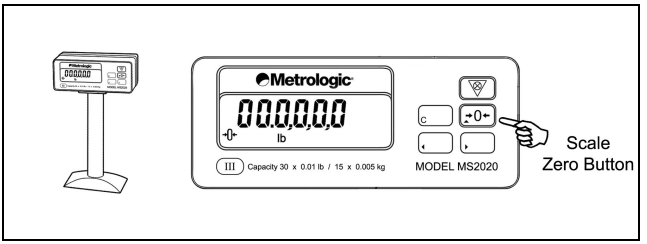


Figure 55. The scale zero button on the remote display.

CALIBRATION

The scanner/scale must be calibrated if:

- it is a first time installation
- the scale cannot be re-zeroed
- there is a change in the weight of measure [i.e. from pounds (lbs.) to kilograms (kg)]
- the calibration verification tests indicate errors
- if the scale load cell has been replaced
- the calibration seal is missing or torn

> The certification of the weighing mechanism of the scale version of this scanner is subject to federal, state and Local Weights and Measures statutes and regulations and can only be performed by authorized government agencies and/or their duly registered agents. Each time the scale or weighing mechanism is calibrated, it should be properly sealed with a paper seal or a lead and wire prior to being placed into service in commerce.
>
> It is the responsibility of the owner of the scale to confirm compliance with the relevant Weights and Measures statutes and regulations applicable in your area by checking with the appropriate government agency before placing a newly calibrated unit into service or removing any official seals.

Tools Required

- 30.0 pound Field Standard Weight Set
- 15.0 kilogram Field Standard Weight Set
- Lead Wire or Paper Seal

> Type of seal to be used will depend on the guidelines specified by the local Weights and Measures authorities.

- Phillips #1 Screw Driver

CALIBRATION

Priming the Scale for Calibration (lbs. & kg)

> Calibrating the scanner/scale must be done **after** the unit has been installed in the checkstand countertop.

1. Check the platter to ensure that nothing is interfering with its freedom to move. This includes cleaning out the debris channel if the scanner/scale has been previously used.

2. Apply power to the scanner/scale.

3. Once the unit is powered up wait 5 minutes before proceeding.

4. Place the 30.0 lbs. (15 kg) weight on the center of the scale, allow the weight to settle, then remove the weight. Repeat three times to prime the scale before calibration.

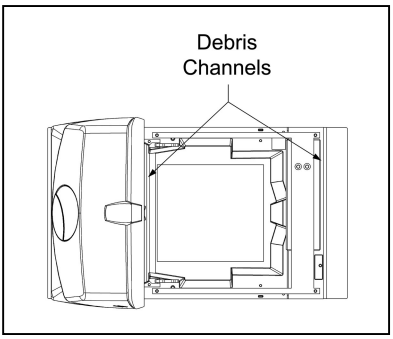


Figure 56. Debris Channels

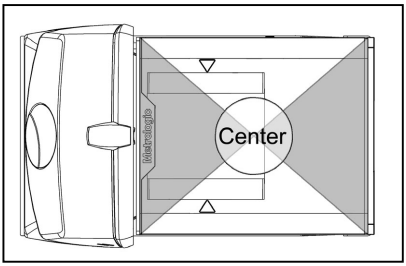


Figure 57. Scale Center

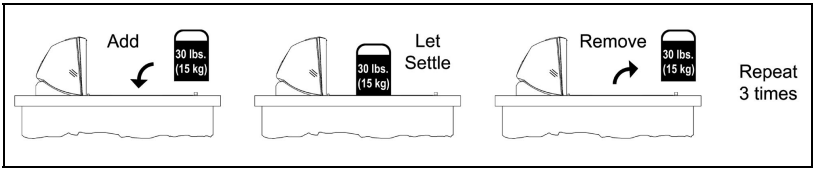


Figure 58. Priming the Scale for Calibration

CALIBRATION

Scale Calibration Sequence (lbs. & kg)

1. Temporarily Remove the platter and place it in a safe location.

> It is the responsibility of the owner of the scale to confirm compliance with the relevant Weights and Measures statutes and regulations applicable in your area by checking with the appropriate government agency before placing a newly calibrated unit into service or removing any official seals.

2. If this is a currently installed scanner/scale in need of calibration, cut and remove the calibration switch cover seal. If this is a new installation there will be no seal.

> Follow all Electo-Static Discharge (ESD) procedures when exposing internal scanner/scale components.

3. Remove the M3 screw securing the calibration switch cover. Place the switch cover and screw in a safe location.

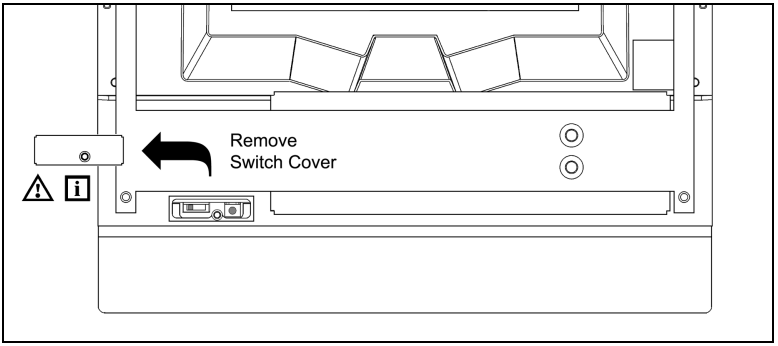


Figure 59. Calibration Switch Plate Cover Removal

CALIBRATION

Scale Calibration Sequence (lbs. & kg)

> You can only calibrate the scale when the scanner/scale is in full service access mode.

4. **Enter full service access mode.** Power down the unit if necessary. Press and hold down the Calibration push button then power up the scanner/scale. Release the Calibration push button.

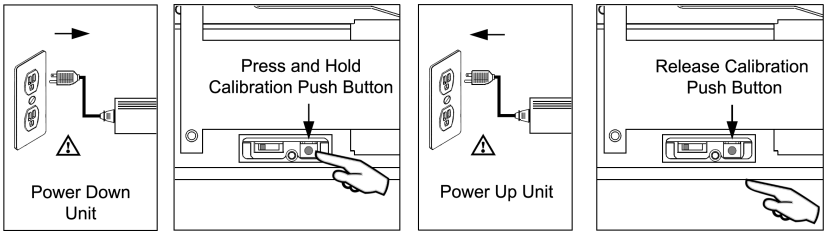


Figure 60. Entering Full Service Access Mode

5. **Enter calibration mode.** On the remote display keypad:

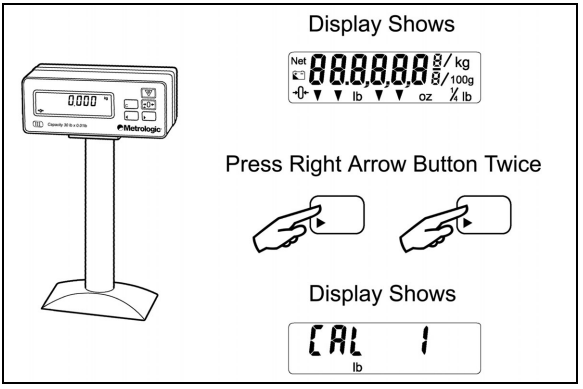


Figure 61. Entering Full Service Access Mode

6. Reinstall the platter onto the scanner/scale. Check the platter to ensure that it is seated properly and nothing is interfering with its freedom to move.

CALIBRATION

Scale Calibration Sequence (lbs. & kg)

7. Make sure there is no load on the scale platter.

8. **Calibrate a zero load.** Press the clear (C) button once when the remote display reads CAL 1 and there is **no** load on the scale platter.

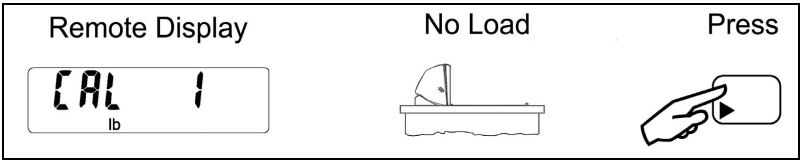


Figure 62.

9. Place a half load on the center of the scale platter then press clear (C).

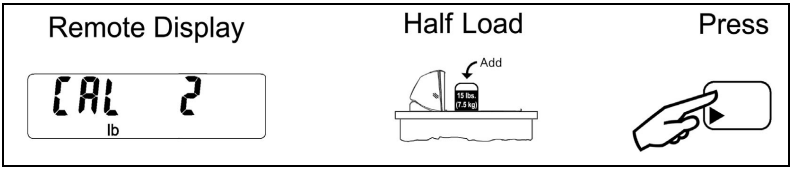


Figure 63.

10. Add an additional half load to the existing half to simulate a full load then press clear (C).

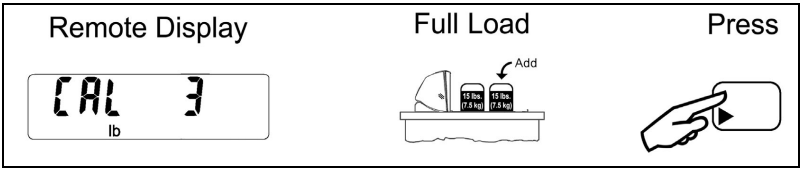


Figure 64.

11. Remove half of the load then press clear (C).

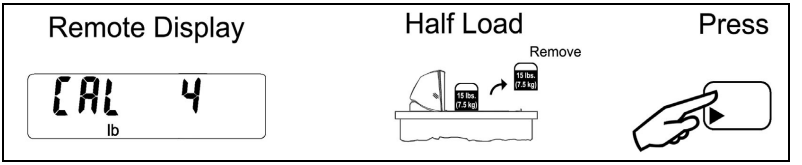


Figure 65.

CALIBRATION

Scale Calibration Sequence (lbs. & kg)

12. Remove the remaining half load from the scale then press then press cancel (C). The message *done* will flash briefly on the display.

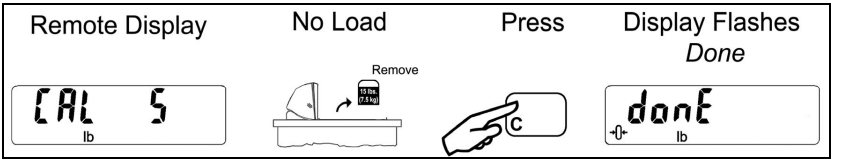


Figure 66.

13. **Exit calibration mode.** Press and hold the test button for at least 3 seconds then release. With no load on the scale the display should read zero lbs.

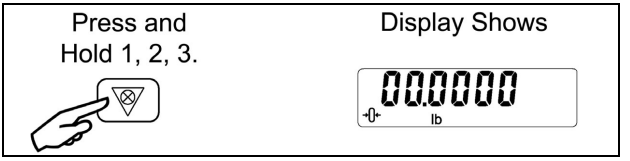


Figure 67.

14. The unit's calibration must now be verified as required by state and/or local Weights and Measures regulations (see pages 74 - 78).

Need to Start Over?

If for any reason you need exit the calibration mode or restart the process press the test button then the clear button.

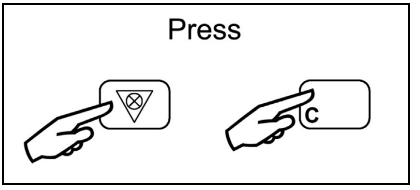


Figure 68.

CALIBRATION VERIFICATION

U.S. Pounds

The following tests verify if the scale's Calibration is accurate. For Kilograms see page 76-78.

- Increasing Load Test
- Shift Test
- Decreasing Load Test
- Return to Zero Test

Increasing Load Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.00 lbs.
2. Place a 5 lb. weight on the surface of the scale platter and verify the display reads 5.00 lbs.
3. Place an additional 5 lb. weight on the center of the scale platter and verify the remote display reads 10.00 lbs.
4. Place a 10 lb. weight on the center of the scale platter and verify the remote display reads 20.00 lbs.
5. Place a 10 lb. weight on the center of the scale platter and verify the remote display reads 30.00 lbs.
6. Remove all the weight from the scale platter and verify the display reads 0.000 lbs.

CALIBRATION VERIFICATION

U.S. Pounds (lbs.)

Shift Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 lbs.
2. Place a 15 lb. weight on the scale platter in zone A (see diagram) and verify the remote display reads 15.00 lbs.
3. Remove the 15 lb. weight and verify the display reads 0.000 lbs.
4. Repeat steps 2 and three for each of the remaining zones (B, C, and D).
5. Verify that the remote display reads 0.000 lbs. when all weight has been removed.

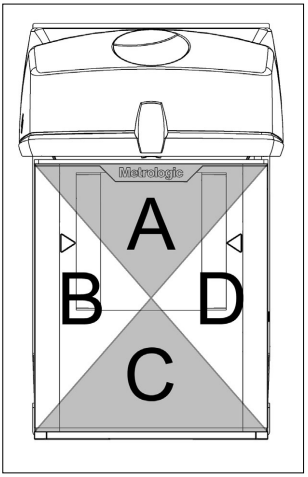


Figure 69. Shift Test Zones

Decreasing Load Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 lbs.
2. Place a 30 lb. load on the platter (use two 10 lb. weights and two 5 lb. weights). Verify the remote display reads 30 lbs.
3. Remove 10 lbs. from the platter. Verify that the remote display reads 20 lbs.
4. Remove another 15 lbs. from the platter and verify the scale reads 5.00 lbs.
5. Remove all the weight from the platter and verify the scale has returned to 0.000 lbs.

Return to Zero Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 lbs.

CALIBRATION VERIFICATION

Kilograms (kg)

The following tests verify if the scale's Calibration is accurate. For US Pounds see page 74-75.

- Increasing Load Test
- Shift Test
- Decreasing Load Test
- Return to Zero Test

Increasing Load test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 kg.
2. Place a 2.5 kg weight on the surface of the scale platter and verify the display reads 2.500 kg.
3. Place an additional 5.0 kg weight on the center of the scale platter and verify the remote display reads 7.50 kg.
4. Place a 10 kg weight on the center of the scale platter and verify the remote display reads 17.05 kg.
5. Place a 10 kg weight on the center of the scale platter and verify the remote display reads 27.05 kg.
6. Remove all the weight from the scale platter and verify the display reads 0.000 lbs.

CALIBRATION VERIFICATION

Kilograms (kg)

Shift Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 kg.

2. Place a 7.5 kg weight on the scale platter in zone A (see diagram) and verify the remote display reads between 7.495 and 7.505 lbs.

3. Remove the 7.5 kg weight and verify the display reads 0.000 lbs.

4. Repeat steps 2 and three for each of the remaining zones (B, C, and D).

5. Verify that the remote display reads 0.000 kg when all weight has been removed.

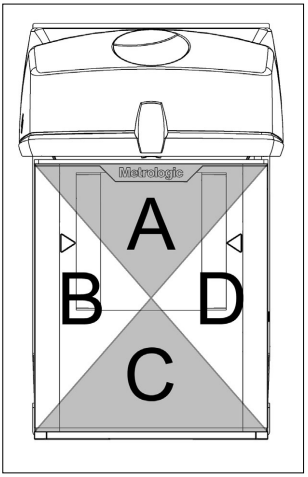


Figure 70. Shift Test Zones

Decreasing Load Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 kg.

2. Place a 15.0 kg load on the platter. Verify the remote display reads between 14.995 and 15.005 kg.

3. Remove 7.5 kg from the platter. Verify that the remote display reads between 7.495 and 7.505 kg.

4. Remove another 5.0 kg from the platter and verify the scale reads 2.500 kg.

5. Remove all the weight from the platter and verify the scale has returned to 0.000 kg.

Return to Zero Test

1. Ensure there is no load on the scale platter and verify the remote display reads 0.000 lbs.

PREPARE THE UNIT FOR SERVICE

If there were no errors during the scale calibration verification tests:

1. Temporarily remove the platter and place it in a safe location.
2. Reinstall the calibration switch cover.
3. Apply the calibration seal (lead wire or paper seal) over the switch cover.

> The certification of the weighing mechanism of the scale version of this scanner is subject to federal, state and Local Weights and Measures statutes and regulations and can only be performed by authorized government agencies and/or their duly registered agents. Each time the scale or weighing mechanism is calibrated, it should be properly sealed with a paper seal or a lead and wire prior to being placed into service in commerce.
>
> It is the responsibility of the owner of the scale to confirm compliance with the relevant Weights and Measures statutes and regulations applicable in your area by checking with the appropriate government agency before placing a newly calibrated unit into service or removing any official seals.
>
> Type of seal to be used will depend on the guidelines specified by the local Weights and Measures authorities

4. Reinstall the platter.

DAILY MAINTENANCE

Smudges and dirt can interfere with the proper scanning of a bar code. Therefore, the output window will need occasional cleaning.

For the glass window:

1. Spray glass cleaner onto lint free, non-abrasive cleaning cloth.
2. Gently wipe the scanner window.

For the red window:

1. Use mild soap and water with lint free, non-abrasive cleaning cloth.
2. Gently wipe the scanner window.

Also make sure the debris channels are cleaned regularly.

HORIZONTAL SCAN WINDOW REPLACEMENT

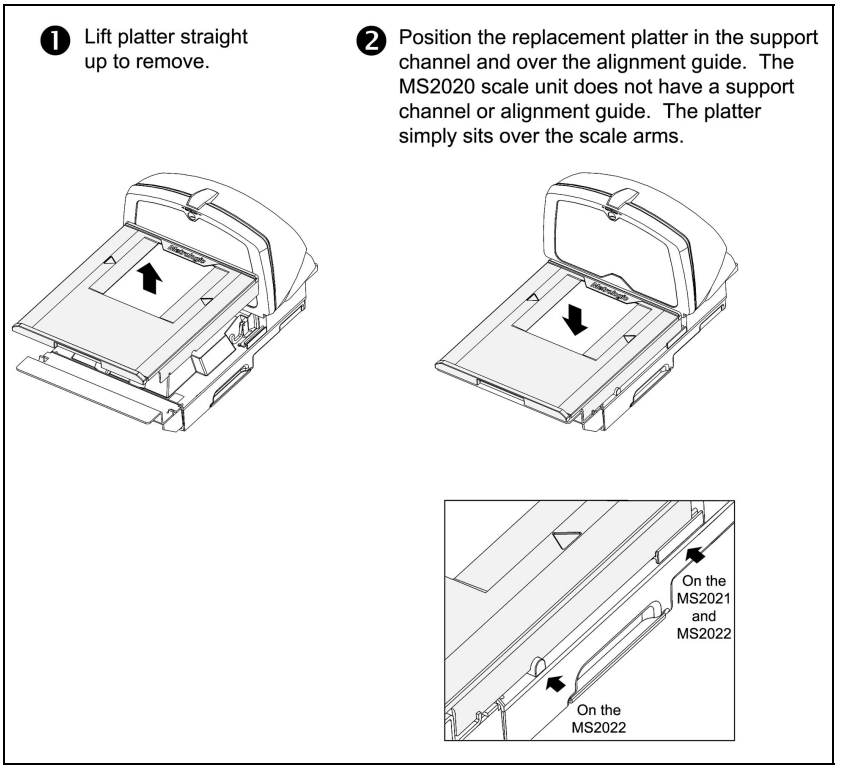

1 Lift platter straight up to remove.
2 Position the replacement platter in the support channel and over the alignment guide. The MS2020 scale unit does not have a support channel or alignment guide. The platter simply sits over the scale arms.
On the MS2021 and MS2022
On the MS2022

Figure 71. Horizontal Scan Window Replacement

VERTICAL SCAN WINDOW REPLACEMENT

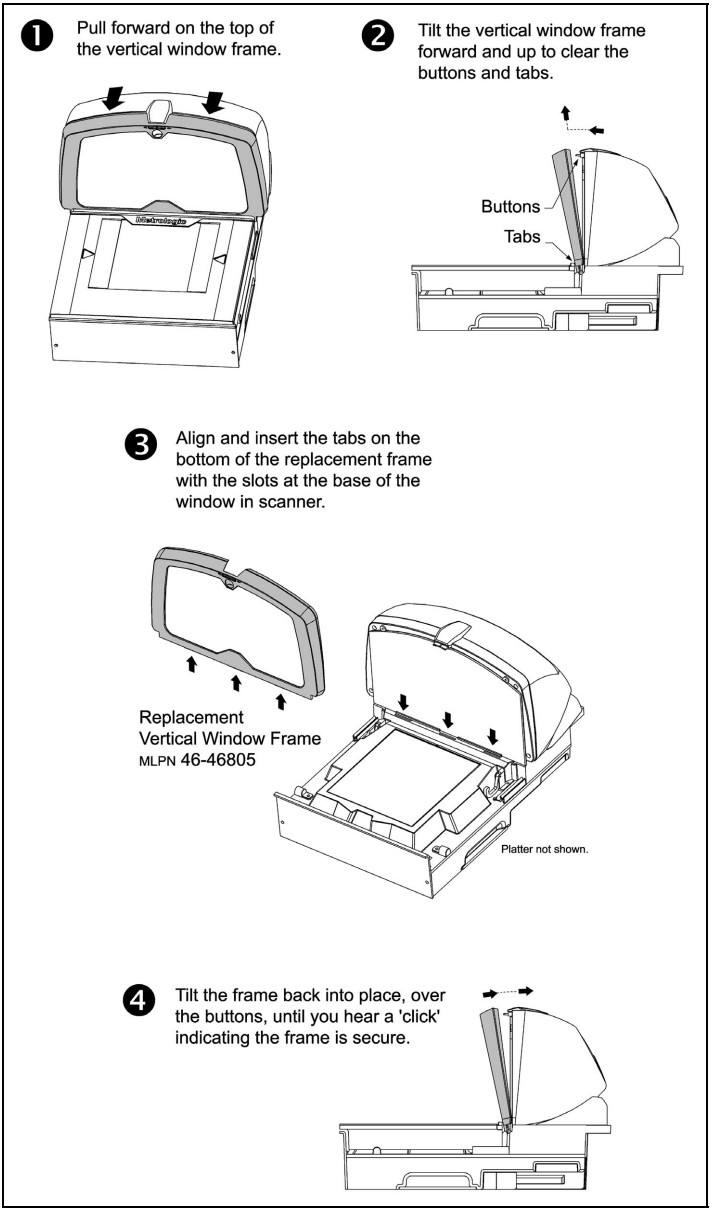

1
Pull forward on the top of the vertical window frame.
2
Tilt the vertical window frame forward and up to clear the buttons and tabs.
Buttons
Tabs
3
Align and insert the tabs on the bottom of the replacement frame with the slots at the base of the window in scanner.
Replacement
Vertical Window Frame
MLPN 46-46805
Platter not shown.
4
Tilt the frame back into place, over the buttons, until you hear a 'click' indicating the frame is secure.

Figure 72. Vertical Scan Window Replacement

TROUBLESHOOTING

The following guide is for reference purposes only. Contact a Metrologic representative at 1-800-ID-METRO or 1-800-436-3876 to preserve the limited warranty terms.

Symptom	Possible Cause(s)	Solution
All Interfaces		
No LEDs, beep or motor spin.	No power is being supplied to the scanner.	Check the transformer, outlet and the power strip. Make sure the power cable is plugged into the scanner.
No LEDs, and no beep.	No power is being supplied to the scanner.	The host system cannot supply enough current to power the MS2020 series scanner. Use the power supply included with the scanner.
During power up the unit beeps 3 times.	A Non-volatile RAM failure.	Contact a Metrologic service representative, if the unit will not hold the programmed configuration.
During power up the unit razzes continuously.	A RAM or ROM failure.	Contact a Metrologic service representative, if the unit will not function.
During power up the unit razzes once and the blue LED flashes.	A VLD failure.	Contact a Metrologic service representative.
During power up the unit razzes twice and both LEDs flash.	Scanner motor failure.	Contact a Metrologic service representative.
There are multiple scans upon presentation of code.	The *same symbol timeout* is set to short.	Adjust same symbol timeout for a longer time.
The unit powers up but does not beep.	The beeper is disabled.	Enable the beeper.
	No volume is selected.	Select a volume.
	No tone is selected.	Select a tone.

Symptom	Possible Cause(s)	Solution
All Interfaces		
The unit powers up but does not scan and/or beep.	The unit is trying to scan a particular symbology that is not enabled.	UPC/EAN and Code 128 are enabled by default. Verify that the type of bar code being read has been selected.
	The unit has been programmed for a character length lock or a minimum length and the bar code being scanned does not satisfy the programmed criteria.	Verify that the bar code that is being scanned falls into the criteria. *Typical of Non-UPC/EAN codes. The scanner defaults to a minimum of 4 character bar code.*
The unit scans a bar code, but locks up after the first scan (*the white LED stays on*).	The scanner is configured to support some form of host handshaking but is not receiving the signal.	If the scanner is setup to support ACK/NAK, RTS/CTS, XON/XOFF or D/E, verify that the host cable and host are supporting the handshaking properly.
The unit scans but the data transmitted to the host is incorrect.	The scanner's data format does not match the host system requirements.	Verify that the scanner's data format matches that required by the host. Make sure that the scanner is connected to the proper host port.
Scanner beeps at some bar codes and NOT form others of the same bar code symbology.	The print quality of the bar code is suspect.	The type of printer and/or the printer settings could be the problem. Check the print mode or change the printer settings. For example change to econo mode or high speed.
	Check the character length lock.	
	The aspect ratio of the bar code is out of tolerance.	

Symptom	Possible Cause(s)	Solution
All Interfaces		
The unit powers up but does not scan and/or beep.	The unit is trying to scan a particular symbology that is not enabled.	UPC/EAN and Code 128 are enabled by default. Verify that the type of bar code being read has been selected.
	The unit has been programmed for a character length lock or a minimum length and the bar code being scanned does not satisfy the programmed criteria.	Verify that the bar code that is being scanned falls into the criteria. *Typical of Non-UPC/EAN codes. The scanner defaults to a minimum of 4 character bar code.*
The unit beeps at some bar codes but NOT for others of the same bar code symbology.	The bar code may have been printed incorrectly.	Check if it is a check digit, character or border problem.
	The scanner is not configured correctly for this type of bar code.	Check if check digits are set properly.
	The minimum symbol length setting does not work with the bar code.	Check if the correct minimum symbol length is set.
RS232 Only		
The unit powers up OK and scans OK but does not communicate properly to the host.	The com port at the host is not working or is not configured properly.	Check to make sure that the baud rate and parity of the scanner and the communication port match and the program is looking for "RS232" data.
	The cable is not connected to the proper com port.	
	The com port is not operating properly.	

Symptom	Possible Cause(s)	Solution
RS232 Only		
The host is receiving data but the data does not look correct.	The scanner and host may not be configured for the same interface.	Check that the scanner and the host are configured for the same interface.
Characters are being dropped.	The intercharacter delay needs to be added to the transmitted output.	Add some intercharacter delay to the transmitted output by using the MetroSelect Configuration Guide (MLPN 00-02407B).
Aux Port Operation With Any Interface		
The secondary scanner is not functioning.		Refer to the user's guide provided with the secondary scanner.
The secondary scanner powers up but data is not relayed to the host.	Cable (MLPN 54-54667) may not be connected to the proper port.	Ensure that the secondary scanner is connected to the MS2020 com port marked "Aux" port.
	The auxiliary com port may not be operating properly.	* The MS2020 series must be programmed to enable the auxiliary port.
		The auxiliary input port's data format must match the main output format of the secondary scanner.

* Use MetroSet.
For the auxiliary interface, choose "HoloTrak Decode"
All remaining parameters will be automatically chosen.

RS232 DEMONSTRATION PROGRAM

If an RS232 scanner is not communicating with your IBM compatible PC, key in the following BASIC program to test that the communication port and scanner are working. This program is for demonstration purposes only. It is only intended to prove that cabling is correct, the com port is working, and the scanner is working. If the bar code data displays on the screen while using this program, it only demonstrates that the hardware interface and scanner are working. At this point, investigate whether the application software and the scanner configuration match. If the application does not support RS232 scanners, a software wedge program that will take RS232 data and place it into a keyboard buffer may be needed. This program tells the PC to ignore RTS-CTS, Data Set Ready (DSR) and Data Carrier Detect (DCD) signals. If the demonstration program works and yours still does not, jumper RTS to CTS and Data Terminal Reading (DTR) to DCD and DSR on the back of your PC.

```
10      CLS
20      ON ERROR GOTO 100
30      OPEN “COM1:9600,S,7,1,CS0,DS0,CD0,LF” AS #1
35      PRINT “SCAN A FEW BAR CODES”
40      LINE INPUT #1, BARCODE$
50      PRINT BARCODE$
60      K$ = INKEY$: IF K$ = CHR$(27) THEN GOTO 32766
70      GOTO 40
100     PRINT “ERROR NO.”; ERR; “ PRESS ANY KEY TO TERMINATE.”
110     K$ = INKEY$: IF K$ = “” THEN GOTO 110
32766   CLOSE: SYSTEM
32767   END
```

COMMUNICATION PARAMETERS

Many functions of the scanner can be "programmed" - that is, enabled or disabled. The scanner is shipped from the factory programmed to a set of default conditions. The default parameter of the scanner has an asterisk (*) in the charts on the following pages. If an asterisk is not in the default column then the default setting is Off or Disabled. Every communication does not support every parameter. If the communication supports a parameter listed in the charts on the following pages, a check mark will appear.

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
UPC/EAN	*	✓	✓	✓	✓
Code 128	*	✓	✓	✓	✓
Code 93		✓	✓	✓	✓
Codabar		✓	✓	✓	✓
Interleaved 2 of 5 (ITF)		✓	✓	✓	✓
MOD 10 Check on ITF		✓	✓	✓	✓
Code 11		✓	✓	✓	✓
Code 39		✓	✓	✓	✓
Full ASCII Code 39		✓	✓	✓	✓
MOD 43 CD on Code 39		✓	✓	✓	✓
Transmit Mode 43 CD		✓	✓	✓	✓
Paraff		✓	✓	✓	✓
Paraff Lead “A”		✓	✓	✓	✓
Allow Paraff Failures		✓	✓	✓	✓
French PC Terminal			✓		
MSI-Plessey		✓	✓	✓	✓
Airline (15 digit) 2 of 5		✓	✓	✓	✓
Airline (13 digit) 2 of 5		✓	✓	✓	✓
Matrix 2 of 5		✓	✓	✓	✓
Telepen		✓	✓	✓	✓
UK Plessey		✓	✓	✓	✓
STD 2 of 5		✓	✓	✓	✓

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
MSI-Plessey 10/10 Check Digit		✓	✓	✓	✓
MSI-Plessey MOD 10 Check Digit		✓	✓	✓	✓
ITF Symbol Lengths	Variable	✓	✓	✓	✓
ITF Minimum Symbol Length	6	✓	✓	✓	✓
Symbol Length Lock	None	✓	✓	✓	✓
Minimum Symbol Length	4	✓	✓	✓	✓
Trioptic		✓	✓	✓	✓
RSS14 Enable		✓	✓	✓	✓
RSS14 ID “]e0”	*	✓	✓	✓	✓
RSS14 App ID “01”	*	✓	✓	✓	✓
RSS14 Check Digit	*	✓	✓	✓	✓
RSS Expanded Enable		✓	✓	✓	✓
Expanded ID “]e0”	*	✓	✓	✓	✓
RSS Limited Enable		✓	✓	✓	✓
RSS Limited ID “]e0”	*	✓	✓	✓	✓
RSS Limited App ID “01”	*	✓	✓	✓	✓
RSS Limited Check Digit	*	✓	✓	✓	✓
DTS/SIEMENS		✓			
DTS/NIXDORF	*	✓			
NCR F		✓			
NCR S		✓			
Beeper Tone	Normal	✓	✓	✓	✓
Beep Transmit Sequence	Before Transmit	✓	✓	✓	✓
Beeper Volume	Loudest	✓	✓	✓	✓
Communication Timeout	None	✓	✓	✓	✓

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
Razzberry Tone on Timeout		✓	✓	✓	✓
Three Beeps on Timeout		✓	✓	✓	✓
No Beeps on Timeout	*	✓	✓	✓	✓
Fast Beep		✓	✓	✓	✓
Beep Twice on Supplements		✓	✓	✓	✓
No Beeps on Timeout	*	✓	✓	✓	✓
5 Retries Before Timeout		✓	✓	✓	✓
Timeout In …	2 secs.	✓	✓	✓	✓
Laser Off Between Records		✓	✓	✓	✓
Variable Laser Off Delay	5 - 635 msec	✓	✓	✓	✓
Disable Button Control of Power Save Mode		✓	✓	✓	✓
Disable Button Control of Beep Volume		✓	✓	✓	✓
Flash LED on Good Scan	*	✓	✓	✓	✓
Reverse LED Convention		✓	✓	✓	✓
Flash LED on Good Scan	*	✓	✓	✓	✓
Enter Power Save Mode	61 mins.	✓	✓	✓	✓
Blink Power Save Mode		✓	✓	✓	✓
Laser OFF Power Save Mode		✓	✓	✓	✓
Laser & Motor OFF Power Save Mode		✓	✓	✓	✓
Dual Action Power Save Mode #1		✓	✓	✓	✓
Dual Action Power Save Mode #2	*	✓	✓	✓	✓
Same Symbol Rescan Timeout: 500 msecs Programmable in 50 msec steps (MAX 6.35 seconds)	*	✓	✓	✓	✓
Intercharacter Delay Programmable in 1 msec steps (MAX 255 msecs)	1 msecs 10 msecs in KBW	✓	✓	✓	

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
Number of Scan Buffers	1	✓	✓	✓	✓
UPC GTIN-14 Format		✓	✓	✓	✓
EAN-8 Enable	*	✓	✓	✓	✓
Transmit EAN-8 Check Digit	*	✓	✓	✓	✓
Convert EAN-8 to EAN-13		✓	✓	✓	✓
EAN-13 Enable	*	✓	✓	✓	✓
Transmit EAN-13 Check Digit	*	✓	✓	✓	✓
UPC-A Enable	*	✓	✓	✓	✓
Convert UPC-A to EAN-13		✓	✓	✓	✓
Transmit UPC-A Check Digit	*	✓	✓	✓	✓
Transmit UPC-A Number System	*	✓	✓	✓	✓
Transmit UPC-A Manufacturers ID.	*	✓	✓	✓	✓
Transmit UPC-A Item ID	*	✓	✓	✓	✓
UPC-E Enable	*	✓	✓	✓	✓
Empand UPC-E		✓	✓	✓	✓
Transmit UPC-E Lead ‘0’	*	✓	✓	✓	✓
Transmit UPC-E Check Digit		✓	✓	✓	✓
Disable UPC-E Auto Redundancy	*	✓	✓	✓	✓
Transmit Codabar Start/Stop Characters		✓	✓	✓	✓
Codabar CLSI		✓	✓	✓	✓
Dual Field Codabar		✓	✓	✓	✓
Tab Between Dual field Codabar		✓	✓	✓	✓
Codabar CLSI Check Digit		✓	✓	✓	✓
Codabar 7-Check Check Digit		✓	✓	✓	✓
Codabar Mod-16 Check Digit		✓	✓	✓	✓

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
Transmit MSI Plessey Check Digits		✓	✓	✓	✓
Number of MSI Plessey Check Digits	0	✓	✓	✓	✓
UK Plessey A to X Convert		✓	✓	✓	✓
UK Plessey Special 12 Character Format		✓	✓	✓	✓
Transmit UK Plessey Check Digit		✓	✓	✓	✓
EAN 128 Enable		✓	✓	✓	✓
Enable French Pharma		✓	✓	✓	✓
Enable Matrix 2 of 5 Check Digit		✓	✓	✓	✓
Enable Hong Kong 2 of 5		✓	✓	✓	✓
Enable Alpha Telepen		✓	✓	✓	✓
Telepen Convert Lead '^L' to 'E'		✓	✓	✓	✓
Enable Code 11 Check Digit		✓	✓	✓	✓
Parity	Space		✓		
Baud Rate	9600		✓		
8 Data Bits			✓		
7 Data Bits	*		✓		
Stop Bits	2		✓		
RTS / CTS Enabled			✓		
Message RTS			✓		
Character RTS	*		✓		
ACK / NAK			✓		
O / N Handshaking			✓		
Host Bell / Cancel			✓		
Xon / Xoff			✓		
No Transmit Without DTR Present			✓		
French PC Terminal Emulation			✓		

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
"D/E" Disable Command			✓	✓	✓
"Z/R" Disable Command			✓	✓	✓
"F/L" Laser Command			✓	✓	✓
"M/O" Motor Enable Commands			✓	✓	✓
Beep on Bell			✓	✓	✓
Razz on 'z'			✓	✓	✓
Activate on DTR			✓	✓	✓
Activate on DC2 Character			✓	✓	✓
Xmit No Read Message on DC2 Timeout			✓	✓	✓
No Transmit LED During No Read Message			✓	✓	✓
Programmable "No Read" Message			✓	✓	✓
Recv "I" = Transmit "METROLOGIC"			✓	✓	✓
Recv "i" = Transmit Scanner ID Byte			✓	✓	✓
STX Prefix			✓		✓
TAB Prefix			✓		✓
Metrologic Prefix			✓		✓
UPC Prefix			✓		✓
ETX Suffix			✓		✓
TAB Suffix			✓		✓
Carriage Return Suffix	*		✓		✓
Line Feed Suffix	*		✓		✓
UPC Suffix			✓		✓
Transmit LRC			✓		✓
Start LRC on 1st Byte			✓		✓
Start LRC on 2nd Byte			✓		✓

DEFAULT SETTINGS

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
'c' Prefix for UPC			✓		✓
'$' Prefix for UPC			✓		✓
Programmable Prefix Characters	10 avail		✓		✓
Programmable Suffix Characters	10 avail		✓		✓
Predefined Code ID Sets	Multiple Selections		✓		✓
Programmable Prefix for Code Types			✓		✓
Programmable Suffix for Code Types			✓		✓
Programmable Code Lengths	7 avail		✓	✓	✓
Code Selects	7 avail		✓	✓	✓
Code Select Timeout 0.1 to 25.5 seconds	5 sec		✓	✓	✓
Replace 1 Character in Transmission			✓		✓
Razz on Code Select Timeout	*		✓	✓	✓
Japan Dual Field Code Selects			✓	✓	✓
Two Digit Supplements		✓	✓	✓	✓
Five Digit Supplements		✓	✓	✓	✓
Require Supplements		✓	✓	✓	✓
Remote Supplement Support		✓	✓	✓	✓
Two Digit Redundancy		✓	✓	✓	✓
Five Digit Redundancy		✓	✓	✓	✓
Enable Coupon Code 128		✓	✓	✓	✓
Transmit Coupon ']C1'	*	✓	✓	✓	✓
Group Separator	*	✓	✓	✓	✓
Coupon Code Can Begin with '4'		✓	✓	✓	✓
Bookland		✓	✓	✓	✓
Convert Bookland to ISBN		✓	✓	✓	✓

COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
Reformat ISBN		✓	✓	✓	✓
Transmit ISBN Check Digit		✓	✓	✓	✓
Bookland 977 2-Digit Supp Required		✓	✓	✓	✓
378 / 379 Supplements		✓	✓	✓	✓
414 / 419 Supplements		✓	✓	✓	✓
434 / 439 Supplements		✓	✓	✓	✓
Number System 2 Enables Supplements		✓	✓	✓	✓
Number System 5 Enables Supplements		✓	✓	✓	✓
100 msec to Find Supplement (100 - 800 msec)	*	✓	✓	✓	✓
Allow Code ID's with Supplements		✓	✓	✓	✓

COMMUNICATION PARAMETERS

Default settings for "*Aux*" interface

The secondary scanner and the MS2020 series always communicates via RS232. Data is relayed to the host via various primary interfaces.

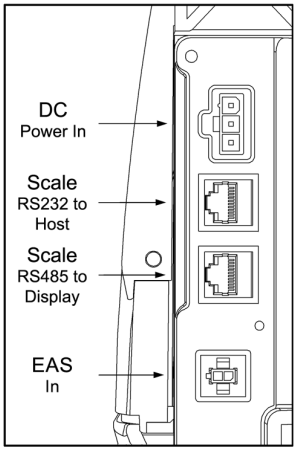
PARAMETER	DEFAULT	OCIA	RS232	IBM 46XX	USB
Aux Baud Rate	38400	✓	✓	✓	✓
Aux parity	none	✓	✓	✓	✓
Aux data bits	8	✓	✓	✓	✓
Aux stop bits	1	✓	✓	✓	✓
Aux character RTS	*	✓	✓	✓	✓
Aux message RTS		✓	✓	✓	✓
Aux Ack/Nak	*	✓	✓	✓	✓
Aux Xon/Xoff	*	✓	✓	✓	✓
Aux D/E commands		✓	✓	✓	✓
Aux M/O commands		✓	✓	✓	✓
Aux F/L commands		✓	✓	✓	✓
Aux Intercharacter Delay	1 msec	✓	✓	✓	✓
Aux PortData Format	None (Disabled)	✓	✓	✓	✓

SCANNER PINOUT CONNECTIONS

The MS2020 Series scanner interfaces terminate to 10-pin modular jacks located on the bottom of the units. The serial number label indicates the model number of the scanner.

DC Power	
Pin	**Function**
1	12VDC
2	Ground
3	5VDC

EAS	
Pin	**Function**
1	EAS In
2	EAS Out



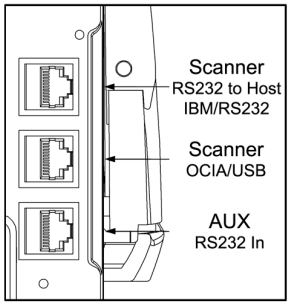


Figure 73. Connector Layout

Scale RS232 Port for Scale Data	
Pin	**Function**
1	Ground
2	Scale RS232 TX
3	Scale RS232 RX
4	Scale RS232 RTS
5	Scale RS232 CTS
6	NC
7	NC
8	NC
9	NC
10	Shield

Scale Manufacture Specific	
Pin	**Function**
1	Scale Display SIG0
2	Scale Display SIG1
3	Scale Display SIG2
4	Scale Display SIG3
5	Scale Display SIG4
6	Scale Display SIG5
7	Scale Display SIG6
8	Scale Display SIG7
9	NC
10	NC

SCANNER PINOUT CONNECTIONS

Scanner IBM to Host	
Pin	**Function**
1	Ground
2	RS232 TX
3	RS232 RX
4	RS232 RTS
5	RS232 CTS
6	RS232 DTR
7	IBM B-
8	IBM A+ / RS232 DSR
9	NC
10	NC

Scanner RS232 to Host	
Pin	**Function**
1	Ground
2	RS232 TX
3	RS232 RX
4	RS232 RTS
5	RS232 CTS
6	RS232 DTR
7	IBM B-
8	IBM A+ / RS232 DSR
9	NC
10	NC

USB or OCIA	
Pin	**Function**
1	Ground
2	OCIA Sdata / LS USB D-
3	OCIA Sdata / LS USB D+
4	OCIA RDATA
5	OCIA RDATA Return
6	OCIA Clock In / FS USB D+
7	OCIA Clock Out / +USBV
8	OCIA Clock In Return / USB D- FS
9	NC
10	Shield

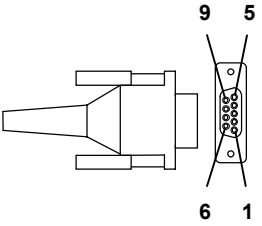
Auxiliary Port RS232 IN Only	
Pin	**Function**
1	Ground
2	RS232 Receive Input
3	RS232 Transmit Output
4	RS232 RTS In
5	RS232 CTS Out
6	NC
7	NC
8	NC
9	+5V Out
10	NC

FS = Full Speed USB
LS = Low Speed USB

CABLE CONNECTOR CONFIGURATIONS

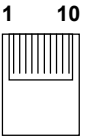
Cable Connector Configurations (Host End)

Cable MLPN 54-54xxx (xxx specifies connection to the host)	
Pin	**Function**
1	Shield Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	DTR Input
5	Power/Signal Ground
6	Reserved
7	CTS Input
8	RTS Output
9	+5VDC



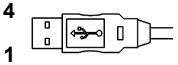
9-Pin D-Type Conn.

RS232 LSO/AUX Cable MLPN 54-54667	
Pin	**Function**
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	RTS Output
5	CTS Input
6-10	N/C



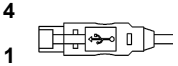
10-pin Modular Plug

Low Speed USB Power Cable (MLPN 54-54165, Type A non-locking)	
Pin	**Function**
1	PC+5V USB
2	D-
3	D+
4	Ground



USB Type A

Full Speed USB Power Cable (MLPN 54-54227A-N, Type A Locking)	
Pin	**Function**
1	PC+5V USB
2	D-
3	D+
4	Ground



Locking Type A with Power

NOTICES

This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense. Any unauthorized changes or modifications to this equipment could void the users authority to operate this device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice
This Class A digital apparatus complies with Canadian ICES-003.

Remarque
Cet appareil numérique de la classe A, conformé a la norme NMB-003 du Canada.

European Standard

Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Funkstöreigenschaften nach EN 55022:1998

Warnung!
Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem fall kann vom Betrieber verlangt werden, angemessene Maßnahmen durchführen.

Standard Europeo

Attenzione
Questo e' un prodotto di classe A. Se usato in vicinanza di residenze private potrebbe causare interferenze radio che potrebbero richiedere all'utilizzatore opportune misure.

Attention
Ce produit est de classe "A". Dans un environnement domestique, ce produit peut être la cause d'interférences radio. Dans ce cas l'utiliseteur peut être amené à predre les mesures adéquates.

CAUTIONS

⚠ Caution
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure. Under no circumstances should the customer attempt to service the laser scanner. Never attempt to look at the laser beam, even if the scanner appears to be nonfunctional. Never open the scanner in an attempt to look into the device. Doing so could result in hazardous laser light exposure. The use of optical instruments with the laser equipment will increase eye hazard.

⚠ Atención
La modificación de los procedimientos, o la utilización de controles o ajustes distintos de los especificados aquí, pueden provocar una luz de láser peligrosa. Bajo ninguna circunstancia el usuario deberá realizar el mantenimiento del láser del escáner. Ni intentar mirar al haz del láser incluso cuando este no esté operativo. Tampoco deberá abrir el escáner para examinar el aparato. El hacerlo puede conllevar una exposición peligrosa a la luz de láser. El uso de instrumentos ópticos con el equipo láser puede incrementar el riesgo para la vista.

⚠ Attention
L'emploi de commandes, réglages ou procédés autres que ceux décrits ici peut entraîner de graves irradiations. Le client ne doit en aucun cas essayer d'entretenir lui-même le scanner ou le laser. Ne regardez jamais directement le rayon laser, même si vous croyez que le scanner est inactif. N'ouvrez jamais le scanner pour regarder dans l'appareil. Ce faisant, vous vous exposez à une rayonnement laser qú êst hazardous. L'emploi d'appareils optiques avec cet équipement laser augmente le risque d'endommagement de la vision.

⚠ Achtung
Die Verwendung anderer als der hier beschriebenen Steuerungen, Einstellungen oder Verfahren kann eine gefährliche Laserstrahlung hervorrufen. Der Kunde sollte unter keinen Umständen versuchen, den Laser-Scanner selbst zu warten. Sehen Sie niemals in den Laserstrahl, selbst wenn Sie glauben, daß der Scanner nicht aktiv ist. Öffnen Sie niemals den Scanner, um in das Gerät hineinzusehen. Wenn Sie dies tun, können Sie sich einer gefährlichen Laserstrahlung aussetzen. Der Einsatz optischer Geräte mit dieser Laserausrüstung erhöht das Risiko einer Sehschädigung.

⚠ Attenzione
L'utilizzo di sistemi di controllo, di regolazioni o di procedimenti diversi da quelli descritti nel presente Manuale può provocare delle esposizioni a raggi laser rischiose. Il cliente non deve assolutamente tentare di riparare egli stesso lo scanner laser. Non guardate mai il raggio laser, anche se credete che lo scanner non sia attivo. Non aprite mai lo scanner per guardare dentro l'apparecchio. Facendolo potete esporVi ad una esposizione laser rischiosa. L'uso di apparecchi ottici, equipaggiati con raggi laser, aumenta il rischio di danni alla vista.

LIMITED WARRANTY

The MS2020 Series scanners are manufactured by Metrologic at its Blackwood, New Jersey, U.S.A. facility. The MS2020 Series scanners have a two (2) year limited warranty from the date of manufacture. Metrologic warrants and represents that all MS2020 Series scanners are free of all defects in material, workmanship and design, and have been produced and labeled in compliance with all applicable U.S. Federal, state and local laws, regulations and ordinances pertaining to their production and labeling.

This warranty is limited to repair, replacement of Product or refund of Product price at the sole discretion of Metrologic. Faulty equipment must be returned to the Metrologic facility in Blackwood, New Jersey, U.S.A. or Puchheim, Germany. To do this, contact Metrologic's Customer Service/Repair Department to obtain a Returned Material Authorization (RMA) number.

In the event that it is determined the equipment failure is covered under this warranty, Metrologic shall, at its sole option, repair the Product or replace the Product with a functionally equivalent unit and return such repaired or replaced Product without charge for service or return freight, whether distributor, dealer/reseller, or retail consumer, or refund an amount equal to the original purchase price.

This limited warranty does not extend to any Product which, in the sole judgement of Metrologic, has been subjected to abuse, misuse, neglect, improper installation, or accident, nor any damage due to use or misuse produced from integration of the Product into any mechanical, electrical or computer system. The warranty is void if the case of Product is opened by anyone other than Metrologic's repair department or authorized repair centers.

THIS LIMITED WARRANTY, EXCEPT AS TO TITLE, IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES, EITHER EXPRESS OR IMPLIED, AND SPECIFICALLY EXCLUDES, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE UNDER THE UNIFORM COMMERCIAL CODE, OR ARISING OUT OF CUSTOM OR CONDUCT. THE RIGHTS AND REMEDIES PROVIDED HEREIN ARE EXCLUSIVE AND IN LIEU OF ANY OTHER RIGHTS OR REMEDIES. IN NO EVENT SHALL METROLOGIC BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES, INCIDENTAL DAMAGES, DAMAGES TO PERSON OR PROPERTY, OR EFFECT ON BUSINESS OR PROPERTY, OR OTHER DAMAGES OR EXPENSES DUE DIRECTLY OR INDIRECTLY TO THE PRODUCT, EXCEPT AS STATED IN THIS WARRANTY. IN NO EVENT SHALL ANY LIABILITY OF METROLOGIC EXCEED THE ACTUAL AMOUNT PAID TO METROLOGIC FOR THE PRODUCT. METROLOGIC RESERVES THE RIGHT TO MAKE ANY CHANGES TO THE PRODUCT DESCRIBED HEREIN.

Corporate Headquarters

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PATENTS

“Patent Information

This METROLOGIC product may be covered by one or more of the following U.S. Patents:

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Other worldwide patents pending.

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